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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL

FOR

JANUARY, 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 4th January, 1905, at 9-15 P.M.

The Hon. Mr. Justice F. E. Pargiter, B.A., I.C.S., President, in the chair.

The following members were present:—

Mr. J. Bathgate, Major W. J. Bythell, R.E., Babu Manmohan Chakravarti, Rai Sarat Chandra Das Bahadur, Mr. F. Doxey, Mr. G. C. Dudgeon, Mr. N. L. Hallward, Dr. W. C. Hossack, Mr. H. H. Mann, Dr. M. M. Masoom, The Hon. Mr. Justice Saroda Charan Mitra, Captain L. Rogers, I.M.S., Pandit Yogesa Chandra Sastree, Pandit Satis Chandra Vidyabhusana.

Visitors:—Mr. H. Chandler, Mr. P. M. Choudry, Rev. Ekai Kamaguchi, Mr. B. T. Pell, and Mr. S. C. Sanial.

The minutes of the last Meeting were read and confirmed.

Sixty-nine presentations were announced.

His Honour Sir A. H. L. Fraser, K.C.S.I., Lt.-Col. H. T. S. Ramsden, I.A., Mr. J. T. Rankin, Mr. Sukumar Sen, Babu Mucksoodan Das, and Mr. F. Turner, were ballotted for and elected Ordinary Members.

It was announced that Babu Roormall Goenka and Major A. H. Bingley, I.A., had expressed a wish to withdraw from the Society.

The President announced that he had, in accordance with the resolution passed at the last Council Meeting, that the objects which the Society decided to lend to the Trustees of the Victoria Memorial Hall for exhibition should be lent to them for exhibition during this cold season as soon as H.E. the Viceroy wished for them—handed them over to the Trustees, except the Asoka stone which the Trustees excluded.

The President also announced that he had received six essays in competition for the Elliott Prize for Scientific Research for the year 1904.

Rai Sarat Chandra Das Bahadur described the Lamaic incarnation of Tibet.

The following papers were read:—

1. *On the Mārkaṇḍeya Purāṇa.—By* THE HON. MR. JUSTICE F. E. PARGITER, B.A., I.C.S.

The paper will not be published in the Journal.

2. *The Dalai Lama's Hierarchy.—By* RAI SARAT CHANDRA DAS BAHADUR, C.I.E.

The paper has been published in Journal, Part I, Extra No., 1904.

3. *On the Prevalence of Fevers in the Dinajpur District.—By* LEONARD ROGERS, M.D., I.M.S., *Officiating Professor of Pathology, Medical College, Calcutta.*

The paper has been published in Journal, Part II, Supplement, 1904.

Ananda

LIBRARY.

The following new books have been added to the Library from January to April 1905. The continuations of all the serials and works in progress have been received.

Abdul Wali, *Maulavi.* Ethnographical Notes on the Muhammadan Castes of Bengal. [*Bombay*, 1904.] 8°.

Reprinted from the Journal of the Anthropological Society of Bombay, vol. VII.

Presd. by the Author.

Abdur Rahman, H. المرتضى [Almortaza or life of Hazrat Ali, the fourth Chalif, with a map of Arabia. In Urdu.] [*Amritsar*, 1901.] 8°.

———. عربي بول چال. [Arabi Bol Chal. Parts I—II. A Treatise on current Arabic dialect in Egypt and Syria. In Urdu.] [*Amritsar*, 1904.] 8°.

———. الصديق. [As-Siddiq or the life of Abu Bakr, the Just, 1st Chalif, with a map of ancient Arabia. In Urdu.] [*Amritsar* 1901.] 8°.

———. كتاب النحو. [Kitab un Nahv. A Treatise on Arabic Syntax. In Urdu.] [*Amritsar*, 1903.] 8°.

———. كتاب الصرف. [Kitab us Sarf. A Treatise on Arabic Etymology. In Urdu.] [*Amritsar*, 1904.] 8°.

———. سفر نامۂ بلاد اسلاميه. [Safarnamai Beladi Islamai. Part I. In Urdu.] [*Amritsar*, 1905.] 8°.

Presd. by the Author.

Abul Fazl Allami, *Shaikh.* آئين اكبري جلد (٢). [Persian Ms. of Ain-i Akbari, vol. II.] 8°.

Presd. by Syed Shamsul Huda.

Ameghino, Florentino. Paleontologia Argentina. *La Plata*, 1904. 8°.

Presd. by the Universidad de la Plata.

Ananda Ranga Pillai. The Private Diary of Ananda Ranga Pillai, Dubash to Joseph François Dupleix, Governor of Pondicherry. A record of matters political, historical, social, and personal, from 1736 to 1761. Translated from the Tamil...and edited by Sir J. F. Price...Assisted by K. Rangachari. vol. I, *etc. Madras*, 1904, *etc.*, 8°.

Presd. by the Government of Madras

————. Dupleix and Labourdonnais. Les Français dans l'Inde. ... Extraits du journal d'Anandarangappoullé... —1736-1748. —Traduits du tamoul par J. Vinson. *Paris*, 1894. 8°.

Presd. by H.H. the Maharaja of Tippera.

ARABIAN NIGHT'S ENTERTAINMENTS. The Book of the Thousand Nights and a Night. Translated from the Arabic by Captain Sir R. F. Burton. Reprinted from the original edition and edited by C. Smithers. Illustrated...by A. Letchford. vols. I. and II. *London*, 1897. 8°.

Presd. by H.H. the Maharaja of Tippera.

ARCHÆOLOGICAL SURVEY OF INDIA. Annual Report, 1902-03, *etc. Calcutta*, 1904, *etc.* 4°.

Presd. by the Survey.

————General Index to the Reports of the Archæological Survey of India. Volumes I to XXIII. Published under the superintendence of Major-General Sir A. Cunningham, by V. A. Smith. With a glossary and general Table of Contents. *Calcutta*, 1887. 8°.

THE ART-JOURNAL. New Series, vol. VI. *London*, 1860. fol.

Presd. by H.H. the Maharaja of Tippera.

ATHARVA VEDA BHĀṢYA. The Atharva Veda Bhāṣya. ...Translation and with the Commentary in Sanskrit and Hindi by Giridhari Lala Shastri. *Farrukhabad*, [.] 8°.

Presd. by the Translator.

AVESTA, PAHLAVI and Ancient Persian studies, in honour of the late Shams-ul-Ulama Dastur Peshotanji Behramji Sanjana. First series, etc. *Strassburg*, 1904, etc. 8°.

Presd. by the Trustees of the Parsee Panchayet, Bombay.

Bernier, François. Travels in the Mogul Empire, A.D. 1656-1668...A revised and improved edition based upon Irving Brock's translation by A. Constable. *Westminster*, 1891. 8°.

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Beylié, De. *General.* Le Palais d'Angkor Vat, ancienne résidence des rois Khmers. *Hanoi*, 1903. 8°.

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Chowkhamba Sanskrit Series, No. 86.

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Chowkhamba Sanskrit Series, No. 82.

Blagdon, Francis William. A Brief History of Ancient and Modern India from the earliest period of antiquity to the termination of the late Mahratta War. *London*, 1805. fol.

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BRITISH MUSEUM. The Coins of the Moghul Emperors of Hindustan...By S. Lane-Poole. Edited by R. S. Poole. *London*, 1892. 8°.

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CACHARI First and Second Reader. *Shillong*, 1904. 8°.

Presd. by the Govt. of Assam.

CAPE TOWN.—*Geological Commission.* Index to the Annual Reports...for the years 1896-1903. Compiled by E. H. L. Schwarz. *Cape Town*, 1904. 8°.

Presd. by the Geological Commission, Cape Town.

Castex, R. Le Péril japonais en Indo-Chine. Réflexions politiques et militaires. *Paris*, [1904.] 8°.

Chantepie de la Saussaye, P. D. Manuel d'histoire des religions. Traduit de l' allemand, etc. *Paris*, 1904. 8°.

Congrés International de Botanique 'a Vienne 1905. Texte synoptique des documents destinés a servir de base aux débats du Congrés International de Nomenclature Botanique de Vienne 1905, presenté au nom de la commission internationale de nomenclature botanique par J. Briquet.
Berlin, 1905. 8°.

Presd. by the Congress.

Cordier, Henri. Histoire des relations de la Chine avec les puissances occidentales, 1860-1902. 3 vols.
Paris, 1901-1902. 8°.

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[*Bombay*, .] 12°.
The Gatha Society's Publications. No. 1.

Presd. by the Trustees of the ***Parsee Panchayet, Bombay.***

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Kiel, Leipzig, 1905. 8°.

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Hedin, Sven. Scientific Results of a journey in Central Asia 1899-1902. Text, vol. 1, *etc.* Maps, vol. 1, *etc.* *Stockholm*, [1904, *etc.*] 4°.

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London, 1823-25. 4°. & fol.

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[*Baharampur*, 1883.] 8°.

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Four new Copper-Plate Charters of the Somavaṃśī Kings of Kośala (and Kaṭaka ?).—*By* GANGA MOHAN LASKAR, M.A.

These four charters, each consisting of three copper-plates, were sent a few months ago from the Pāṭnā State in the Central Provinces to the Asiatic Society of Bengal, and the task of deciphering them was entrusted to me. They form an addition to the series of six charters of the Somavaṃśi Kings edited or re-edited by Mr. Fleet in the Epigraphia Indica (Volume III, pages 323 to 359). Four of the published charters were granted by Mahā-Bhavagupta I, one by Mahā-S'ivagupta and the last by Mahā-Bhavagupta II. Of the four new charters one belongs to the first and the remaining three to the second of these kings. Thus we now possess five land-grant charters of Mahā-Bhavagupta I, four of his son Mahā-S'ivagupta and one of the latter's son Mahā-Bhavagupta II. A copper-plate charter granted by Puñja, a feudatory chief under Mahā-Bhavagupta II, in the 13th year of the latter's reign, has been edited by Dr. Kielhorn in Epi. Indica, Volume IV. (page 254, &c.).

The language and forms of expressions of the new charters are much the same with those employed in the old ones. The characters in which they are inscribed are the same. They do not bring out any new important facts about the history or the identification of the grantors, except the names of the villages granted and a few other minor details scarcely worthy of notice. The historical and palæographical remarks made by Mr. Fleet on the old records apply equally to the new ones. Yet a few words may not be unnecessary to serve as an introduction to the account of the newly-discovered copper-plates given in the following pages.

Mr. Fleet calls his charters as A, B, C, D, E and F; the new ones may be named G, H, I and J respectively. These ten charters, together with the one granted by Puñja, are the only records that we possess of this dynasty. They disclose to us the names of four successive kings, *viz.*, (1) S'ivagupta, (2) Mahā-Bhavagupta I *alias* Janamejaya, (3) Mahā-S'ivagupta *alias* Yayāti, and (4) Mahā-Bhavagupta II *alias* Bhīmaratha. Each of the first three was the father of his successor. They call themselves as members of the Somakula (lunar race) and as the 'lords of the three Kaliṅgas.' They grant lands in the different districts of the Kośala country. In the grants B, C and D, issued in the thirty-first year of his reign, Mahā-Bhavagupta is referred to by the title Kośalendra (lord of Kośala). Charter J is said to have been written by a clerk of the office of the 'minister for peace and war' of the Kośala country. These facts prove beyond doubt that these kings ruled over the Kośala country, or at least a part of it. About five of the copper-plate charters were found in the Native State of Pāṭnā in the Central Provinces, and the remaining five in the neighbourhood of Kaṭaka (or Cuttuk). The charters of Mahā-S'ivagupta and his son are issued from Vinītapura and Yayātinagara, towns or a town on the Mahānadī river. The village granted by the charter E is said to be situated in Dakṣiṇa-Tosalā* which may be a mistake for Dakṣiṇa-Kośalā or Southern Kośala. These facts show that it was Dakshina-Kośala (or southern Kośala), identifiable with the south-eastern parts of the Central Provinces, which was included in the kingdom of these kings.

Mr. Fleet thinks that these kings ruled over Orissa also and had their capital at Kaṭak (Cuttack), and that both Vinītapura and Yayātinagara, the issuing places of the charters of Mahā-S'ivagupta and his son, were identical with it. His view is based upon the word "Vijaya-kaṭaka," which is applied to the issuing places of Mahā-Bhavagupta I's charters. He considers it to be a proper name denoting the modern town Cuttuk. The collocation of words in which the term occurs would suggest another meaning. The expressions **मूरसौमसमावाषितश्रौमतो विजयकटकात्** and **षारामसमावाषित-**

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* The word Tosali as the name of some country in or near Orissa is as old at least as the third century B.C. The two separate edicts of Asoka found in the version of Dhauli in Orissa are addressed to the officials at Tosalī. The expressions "Ubhaya Tosalyāṃ" (*i.e.*, in both divisions of Tosalī) and "Dakṣiṇa Tosalyāṃ Frāṅga (doubtful) viṣaye" (*i.e.*, in the Frāṅga *viṣaya* or district in Southern Tosalī) occur in an old copper-plate grant found in some Native State in Orissa. It is written in the old Gupta characters and cannot be of a date later than the 5th Century A.D. It is clear from the above that Tosalī was a country very near to, if not comprised in, the possessions of the Somavaṃśī kings under notice. So we cannot be free from doubt when we take Dakṣiṇa Tosalā as a mistake for Dakṣiṇa Kośala (Southern Kosala). Only two small fragments of the plate mentioned above were found. The inscription was very sadly damaged. The name of any king could not be found. The few words that could be satisfactorily deciphered convinced me that it was certainly a land-grant charter. A seal was received with the above fragments. It was circular in shape and had a diameter of two-and-a-half inches. One face of it contained in its upper half a female figure, seated on a lotus, with two elephants (one on each side) having their trunks uplifted over her head. This emblem is similar to that found on the seals of the Somavaṃśī kings under notice. There was a line of writing below the emblem, but it was too much damaged to be diciphered.

श्रीमतो विजयकटकात् would, as they stand, mean 'from the glorious camps of victory pitched at Murasīma and Ārāma, respectively,' or "from the camps of victory of the glorious king (**श्रीमतो**) who was residing at Mūrasīma and Ārāma, respectively." Mr. M. M. Chakravarti, who assigns the charters to the 12th century rather than to the 11th as done by Mr. Fleet, objects to Mr. Fleet's interpretation of the term and considers that these kings could not rule in Orissa, for at that date kings of the Gaṅgāvaṃśa dynasty were masters of that province.

The title Tri-Kaliṅgādhipati (lord of the three Kaliṅgas) used by these kings requires a little consideration. The word Tri-Kaliṅga is a vague term to us. But it seems to be sure that it included the whole of Kaliṅga with at least a few districts in the neighbourhood. Now Kaliṅga was a strip of country between the sea-coast and the Eastern Ghats. It extended to about Vizagapatam in the south. Its northern limit is said in the Mahābhārata to be the river Vaitaranī (mod. Byterni), which river and the Kaliṅga people the Pāṇḍavas are described to have reached at the same time on their southward progress from Bengal in the course of pilgrimage. According to this account, Kaliṅga would include a considerable portion of Orissa. But the limits of countries fluctuated from time to time and there is no certainty that the same river was the northern boundary of Kaliṅga also at the time of the inscriptions under notice. Be that as it may, we find in these inscriptions some points which would indicate that Kośala was included in the countries known as Tri-Kaliṅga (or the three Kaliṅgas). The grantors of these charters have the title Tri-Kaliṅgādhipati attached to their names, but not the title Kośalendra (lord of Kośala), although they were undoubtedly the masters of the Kośala country. Indeed, by the latter title Mahā-Bhavagupta I is referred to in charters B, C and D. But this title is not used along with their names nor is it joined to the title Tri-Kaliṅgādhipati, which is almost invariably prefixed to their names. This seems to show that the title Tri-Kaliṅgādhipati was thought sufficient by these kings to imply their possession of Kośala also. It is therefore probable that Kośala, (*i.e.*, Southern Kośala) was included in Tri-Kaliṅga (three Kaliṅgas). Thus we see that they possessed at least a part of Tri-Kaliṅga and therefore the title Tri-Kaliṅgādhipati was not altogether an honorific one as thought by Mr. M. M. Chakravarti. I do not mean to say, however, that the whole of Tri-Kaliṅga was under their rule. That these kings held sway over what is now called the Pāṭnā State is certain. Two of *the viṣayas* or districts are called Telātaṭṭa and Oṅgātaṭa (see Table). These names imply that they were on the banks of the Telā (Mod. Tel) and the Oṅgā (Mod. Ong) river. These rivers flow across the Pāṭnā State into the Mahānadī and are found on the maps. Hence the Pāṭnā State or a considerable part of it formed part of their kingdom.

If Mr. Fleet's identification of Vinītapura and Yayātinagara with the town of Kaṭak (Cuttuk) be correct, we may notice this fact. The issuing places of Mahā-Bhavagupta I's charters are described as विजय कटक। The charters granted in the 8th and 9th years of his son Mahā-S'ivagupta (Yayāti) are issued from Vinîtapura; while the charters granted in the 24th and the 28th years of the latter's reign and the one granted by his son are issued from Yayātinagara. Taking Mr. Fleet's view to be correct, we may say that Mahā-S'ivagupta, who was otherwise called Yayāti, changed the name of his capital and called it after his own name as Yayātinagara ('city of Yayāti'), and his son also continued the new name.

No grants of S'ivagupta, the first king, has come down to us. He is not called Trikaliṅgādhipati, nor is the word Mahā (the Great) prefixed to his name. This shows that the powers and possessions of this dynasty were increased by Mahā-Bhavagupta I. His son Mahā-S'ivagupta is said in one of the eulogistic verses to have defeated Ajāpāla (a king probably) in battle and to have captured thirty-two big elephants. From the third plate of Charter H, which is the worst executed of the charters, it appears that he defeated the *Cedis* and devastated their country (Ḍahālā).

I have made a tabular abstract of the whole series of ten charters. This will facilitate their comparative study and will save the trouble of going through the records themselves. The abstract is appended with this paper.

Some Details common to the new Charters (G, H, I, and J).

As already stated, they were found somewhere in the Native State of Pāṭnā attached to the Sambalpur district in the Central Provinces. Each charter consists of three plates strung together by a thick ring, the ends of which are joined in a circular seal. The seal bears in relief a seated female figure with two elephants with uplifted trunks. Other details of the seals cannot be well distinguished owing to the rust that has accumculated upon them. The inscriptions are on both sides of the middle plate and on the inner sides of the first and the third plate. In J, the inscription extends to the outer side of the third plate. The characters employed are Nāgarī of the northern type and belong to that particular variety of it to which the name of Kuṭila has come to be applied. The engraving is usually deep and legible; the letters do not usually show through on the opposite sides of the plates. The language employed in these records is Sanskrit; and except for the benedictive, imprecatory and eulogistic verses, they are generally in prose throughout. A point of orthography common to all these records is the use of *v* for *b*.

G.—Pāṭnā Copper-Plate Grant of the 6th year of Mahá-Bhavagupta's reign.

The plates, the ring and the seal together weigh 2 seers and $12\frac{1}{2}$ chhataks (*i.e.*, a little more than $5\frac{1}{2}$ lbs.). Each of the plates measures about $7\frac{7}{8}''$ by $5''$. The ring is about half an inch in thickness and 4″ in diameter. The seal is $1\frac{7}{8}$″ in diameter. In relief on a countersunk surface it shows a seated female figure, perhaps of the goddess Lakṣmī, with two elephants. The plates are almost smooth; only the middle one and a side of another have their ends raised into rims to protect the writing. The inscription, which is deep, is in a state of perfect preservation. Although the engraving is deep, the letters do not show through on the reverse sides of the plates as the latter are substantial. The characters are 'Kuṭila.' They include forms of decimal figures for 6, 13 and 5 in lines 42, 43 and 46 respectively.

The *avagraha* does not occur in this record. Final forms occur of *t* in *Kaṭakāt* (line 1), *vaset* (line 24), *dadyāt* (line 26), *Samvat* (line 42); and of *n* in *ādin* and *sarvvān* (line 7), in *etān* and *pārthivendrān* (line 37). The language is Sanskrit, and except for the benedictive and imprecatory verses from lines 20 to 40, the whole record is in prose. The rules of Sandhi are neglected in several places. There are several spelling mistakes which must have been due to the Kâyastha (or clerk), *e.g.*, **कृषलो**, **बकलिङ्ग**, the use of *ū* for *u* and several others. The average size of the letters is about $\frac{3}{8}$ of an inch. *V* is used for *b* throughout. *R* is used for *l* in pravarggayanti in line 27.

This charter is the second of the two (A and G) issued in the 6th year of Mahā-Bhavagupta's reign. In lines 16 and 17, the village granted is said to have been made revenue-freé (**अकरीकृत्य**); yet in the concluding two lines a nominal revenue of five silver coins a year seems to be fixed as the king's share. The charter is moreover called in line 45 to be a revenue-charter (Kara-S'āsanam). Charter A also conveys lands subject to a similar yearly payment. In lines 19 and 20, we find the expression "*prativarṣa-dātavya-rūpyakāṣṭapalakaradānam viniscitya.*

Abstract of the Contents of G.

From the victorious camp located at Murasima [or from the victorious (city of) Kaṭaka]—

[ll. 1-4] The most devout worshipper of (the god) Mahes'vara, the Paramabhaṭṭāraka, the Mahārājādhirāja, the ornament of the Somakula, the lord of the three Kaliṅgas, the Parames'vara, the glorious Mahā-Bhavagupta-râjadeva, who meditates on the feet of the Paramabhaṭṭāraka, the Mahārājādhirāja, the Parames'vara, the glorious

[ll. 4-5] S'ivaguptadeva, ["being in residence at Murasima," (this is to be put here if the interpretation of the description of the place of issue given above in the 1st line of the Abstract be objected to)], being in good health and having done worship to the Brāhmans of the Pásitalā village in the Potā district (viṣaya),

[ll. 5-8] issues this command to the cultivators and other inhabitants of the village as well as to all the dependents of the king who may be living from time to time in that district, such as the Samâhattṛs, &c.

[ll. 8-18] "Be it known to you that for the increase of the religious merit and glory of our (श्रीदेव मातापित्रोः) *godly parents* as well as of our own selves, this village,—with everything included within its four boundaries, with its hidden treasures and deposits, with the freedom from all lets and hindrances, with the power to receive all extra cesses, with its ditches and deserts, with the exemption from the entrance into it by regular and irregular troops—is granted by us with libations of water, after being made revenue-free—to be enjoyed as long as the moon, the stars, the sun and the earth endure,

[ll. 11-14] to Bhaṭṭaputras (Śrī) Keśava and (Śrī) Apya, sons of Bhaṭṭa Dāddī, belonging to the Kauśika *gotra*, with the *pravaras* Audala, Devarāta and Viśvāmitra, students of the Kāṇva *śākhā*, immigrants from Kommāpira and inhabitants of Loisṛgā.

[Ll. 17-18] Knowing this you should live in happiness, rendering unto them (the donees) the taxes, gold and other shares of their enjoyments.

[Ll. 18-40.] In these lines are contained the mandate to future kings for the preservation of the grant and the usual imprecatory and benedictive verses (for which see the translation of J.). [Ll. 40-46]. This charter was written by Kāyastha Koighoṣa, son of Ballabhaghoṣa and a writer attached to the office of the Mahāsāndhivigrahin Malladatta, son of Dhâradatta, on the thirteenth *tithi* of the bright fortnight of the month of Kārtika in the sixth year of the victorious reign of Paramabhaṭṭāraka, Mahārājādhirāja, the Parameśvara, the glorious Janamejayadeva, Or (dated) in figures, Saṃvat 6, Kārtika sudi 13. This revenue-charter is granted after the fixing of the yearly revenue as five silver coins.

H.—Pāṭnā Copper-Plate Grant of the 8th year of (Yayāti) Mahā-Śivagupta's reign.

The weight of the plates, the ring and the seal together is 3 seers and 6 chhataks (or about 7*lbs*). Each of the plates measures 8″ by 5½.″ The ring is 4½″ in diameter. The usual device on the seal is visible. The interiors of the letters show marks of the working of the engraver's tools. The engraving is deep; but it has been done with extreme haste and carelessness, so that many letters and sometimes whole words have been omitted through mistake. The record is full of spelling mistakes and other gross inaccuracies. The material is very soft; so that the edges of the engraved lines have been pressed up considerably above the surface of the plates. For these reasons it has not been possible to read the record completely and in certain parts, especially towards the end, the meaning has remained obscure. The characters include decimal figures for 8 and 13 in lines 39 and 40 respectively. The *avagraha* occurs in यशोऽभिवृद्धये in line 13.

Abstract.

It is issued from Vinitapura. The place of issue is mentioned in the words (Vinitapurāt Kaṭakāt), which incline one to Mr. Fleet's view about the identification of Vinītpura with Cuttak; for the word 'Kaṭakāt' looks as if it were in apposition with Vinītapura. The words may, under this view, be translated as "from Vinītpura, which is Kaṭaka."

This inscription purports to convey lands on the northern part of the Dāśānarīya river (or the river of the Daśārṇa country), belonging to the village Talakajja in Sanulā (or Sanṛlā) *Viṣaya* (district) in the Kośala country—to a Brāhmaṇa, named Kāmadeva, grandson of Harṣa and son of Narasiṃha, an immigrant from Māddhīla and a resident of Jalajaḍḍa in Kośala, having the *pravaras* Gotrapa, Kasyapa, Vatsa and Naidhruva, and a student of the Mādhyandina *Śākhā* of the Vājasaneya (Saṃhitá).

Lines 15-36 contain the usual injunction to future kings with the benedictive and imprecatory verses about the merits of the preservation and the demerits of the confiscation of granted lands.

Lines 36-41 tell us that it was written by Uccavanāga (or Utsavanāga ?), the *Utthitāsanī* (?), son of Samamphenāllava (?), by the command of the *rāṇaka* Dhāradatta, the Mahā-Sāndhivigrahin, in the 8th year of the victorious reign of Yayātideva, and that it was engraved by Vijñānī Mādhava, son of Vāsu.

Lines 40-42 contain a verse setting forth the transitoriness of life and its pleasures and enjoining the preservation of the good works of others. The next lines are very obscure. They speak of a powerful Kosala king of the Somavaṃśa (referring probably to Mahā-S'ivagupta himself) who defeated probably the *Cedis* (चोद्यान may be a mistake for चैद्यान्). The last two words of the record speak of the devastation of some place, probably *Dāhala* or the *Cedi* country ("डहाणा विजनाश्चकार "made Dahāṇā or Dāhala uninhabited"). The same king probably was the author of the devastation.

I.—Pāṭnā Copper-Plate Grant of the 24th year of Yayāti-Mahā-Śivagupta's reign.

Each of the plates measures 8½″ by 6½″. The ring is 5½″ in diameter. The diameter of the seal is 2¼″. It contains the usual female figure. The weight of the plates, the ring and the seal together is 4 *seers* and 5 *chataks* (or nearly 9℔). The characters includes decimal figures for 24 and 5 in line 62. The *virāma* occurs in चारात् (l. 12), तस्मात् and नगरात् in line 13, and in वल्लभादीन् in line 24. It is mistakenly omitted in एतान् and न्द्रान् in lines 56 and 57 respectively. Final forms occur of *n* in प्रवाराान् (l. 18) रदान्, संज्ञान (l. 19) and करीन्द्रान् (20); and of *m* (म) with a *virama* below in उत्कीरितम् in the last line. The *avagraha* occurs wrongly in जित्वाऽजापालम् in line 19 and correctly in पुण्ययशोऽभिवृद्धये in line 38. The average size of the letters is ⅜ of an inch. As for the orthography, we may notice the use of ꣳ (ं) for *anusvāra* in चतुर्विंशति

[ll. 8-18] "Be it known to you that for the increase of the religious merit and glory of our (श्रीदैव मातापित्रोः) *godly parents* as well as of our own selves, this village,—with everything included within its four boundaries, with its hidden treasures and deposits, with the freedom from all lets and hindrances, with the power to receive all extra cesses, with its ditches and deserts, with the exemption from the entrance into it by regular and irregular troops—is granted by us with libations of water, after being made revenue-free—to be enjoyed as long as the moon, the stars, the sun and the earth endure,

[ll. 11-14] to Bhaṭṭaputras (Śrī) Keśava and (Śrī) Apya, sons of Bhaṭṭa Dāddī, belonging to the Kauśika *gotra*, with the *pravaras* Andala, Devarāta and Viśvāmitra, students of the Kāṇva *śākhā*, immigrants from Kommāpira and inhabitants of Loisṛgā.

[Ll. 17-18] Knowing this you should live in happiness, rendering unto them (the donees) the taxes, gold and other shares of their enjoyments.

[Ll. 18-40.] In these lines are contained the mandate to future kings for the preservation of the grant and the usual imprecatory and benedictive verses (for which see the translation of J.). [Ll. 40-46]. This charter was written by Kāyastha Koighoṣa, son of Ballabhaghoṣa and a writer attached to the office of the Mahāsāndhivigrahin Malladatta, son of Dhāradatta, on the thirteenth *tithi* of the bright fortnight of the month of Kārtika in the sixth year of the victorious reign of Paramabhaṭṭāraka, Mahārājādhirāja, the Parameśvara, the glorious Janamejayadeva. Or (dated) in figures, Saṃvat 6, Kārtika sudi 13. This revenue-charter is granted after the fixing of the yearly revenue as five silver coins.

H.—Pāṭnā Copper-Plate Grant of the 8th year of (Yayāti) Mahā-Śivagupta's reign.

The weight of the plates, the ring and the seal together is 3 seers and 6 chhataks (or about 7*lbs*). Each of the plates measures 8″ by 5½.″ The ring is 4½″ in diameter. The usual device on the seal is visible. The interiors of the letters show marks of the working of the engraver's tools. The engraving is deep; but it has been done with extreme haste and carelessness, so that many letters and sometimes whole words have been omitted through mistake. The record is full of spelling mistakes and other gross inaccuracies. The material is very soft; so that the edges of the engraved lines have been pressed up considerably above the surface of the plates. For these reasons it has not been possible to read the record completely and in certain parts, especially towards the end, the meaning has remained obscure. The characters include decimal figures for 8 and 13 in lines 39 and 40 respectively. The *avagraha* occurs in यशोऽभिवृद्धये in line 13.

Abstract.

It is issued from Vinitapura. The place of issue is mentioned in the words (Vinitapurāt Kaṭakāt), which incline one to Mr. Fleet's view about the identification of Vinītpura with Cuttak; for the word 'Kaṭakāt' looks as if it were in apposition with Vinītapura. The words may, under this view, be translated as "from Vinītpura, which is Kaṭaka."

This inscription purports to convey lands on the northern part of the Dāśānarīya river (or the river of the Daśārṇa country), belonging to the village Talakajja in Sanulā (or Sanṛlā) *Viṣaya* (district) in the Kośala country—to a Brāhmaṇa, named Kāmadeva, grandson of Harṣa and son of Narasiṃha, an immigrant from Māddhila and a resident of Jalajaḍḍa in Kośala, having the *pravaras* Gotrapa, Kasyapa, Vatsa and Naidhruva, and a student of the Mādhyandina *Śākhā* of the Vājasaneya (Saṃhitâ).

Lines 15-36 contain the usual injunction to future kings with the benedictive and imprecatory verses about the merits of the preservation and the demerits of the confiscation of granted lands.

Lines 36-41 tell us that it was written by Uccavanāga (or Utsavanāga ?), the *Utthitāsanī* (?), son of Samamphenāllava (?), by the command of the *rāṇaka* Dhāradatta, the Mahā-Sāndhivigrahin, in the 8th year of the victorious reign of Yayātideva, and that it was engraved by Vijñānī Mādhava, son of Vāsu.

Lines 40-42 contain a verse setting forth the transitoriness of life and its pleasures and enjoining the preservation of the good works of others. The next lines are very obscure. They speak of a powerful Kosala king of the Somavaṃśa (referring probably to Mahā-Śivagupta himself) who defeated probably the *Cedis* (**चोद्यान** may be a mistake for **चैद्यान्**). The last two words of the record speak of the devastation of some place, probably *Dāhala* or the *Cedi* country ("**डहाणा विजनाश्चकार** "made Dahāṇā or Dāhala uninhabited"). The same king probably was the author of the devastation.

I.—Pāṭnā Copper-Plate Grant of the 24th year of Yayāti-Mahā-Śivagupta's reign.

Each of the plates measures 8½" by 6½". The ring is 5½" in diameter. The diameter of the seal is 2¼". It contains the usual female figure. The weight of the plates, the ring and the seal together is 4 *seers* and 5 *chataks* (or nearly 9lb). The characters includes decimal figures for 24 and 5 in line 62. The *virāma* occurs in **धारात्** (l. 12), **तस्मात्** and **नगरात्** in line 13, and in **वल्लभादीन्** in line 24. It is mistakenly omitted in **एतान्** and **न्द्रान्** in lines 56 and 57 respectively. Final forms occur of *n* in **प्रवाहान्** (l. 18) **रदान्**, **संग्रान्** (l. 19) and **करीन्द्रान्** (20); and of *m* (**म**) with a *virama* below in **उत्कीरितम्** in the last line. The *avagraha* occurs wrongly in **जित्वाऽआपाल्लम्** in line 19 and correctly in **पुण्ययशोऽभिवृद्धये** in line 38. The average size of the letters is ⅜ of an inch. As for the orthography, we may notice the use of ꣳ (**ङ**) for *anusvāra* in **चतुर्विङ्शति**

in line 61 and the use of *n* (न) for *anusvāra* in ध्वन्यु in line 9. *V* is used for *b* as usual in these records.

The wordings of the present record are almost identical with those of J. Both the donor and the donee are the same persons with those in charter J. Both these charters were issued from the same place Yayātinagara. The only difference lies in (1) the names of the villages granted, (2) the names of the writers and engravers and (3) in the dates. The present charter does not contain the verse in praise of the Sāndhivigrahin (who is however a different person here) which is found in J toward the close.

This charter purports to convey the (lines 25-26) village of Ḍelāḍelī in the Telātaṭṭa *viṣaya* in the Kosala country to Bhaṭṭa-Mahodadhi.

[Ll. 59-64].—"This charter was written by the *Kāyastha* Tathāgata, a writer belonging to the office of the Mahāsāndhivigrahin, the *Rāṇaka* Dhāradatta, on the fifth *tithi* of the bright fortnight of the month of Aṣāḍha in the twenty-fourth year of the prosperous and victorious reign of..........the glorious Yayātideva." It was engraved by *Vijñānī* Vāsuka.

For the translation of this record, reference is made to the translation of J, with which it is identical in almost all parts.

J.—Pāṭnā Copper-Plate Grant of the 28th year of Yayāti-Mahā-Śivagupta's reign.

Each plate measures 9½″ by 7.″ The ring is slighty above ½″ in thickness and is 4¾″ in diameter. The diameter of the seal is 2⅙.″ It contains the usual female figure, etc. The weight of the the whole is 4 *seers* and 5 *chataks* (or about 9 lbs). The inscription extends to a portion of the outer side of the third plate. The average size of the letters is about ⅜″. The engraving is good and fairly deep; but the plates being substantial the letters do not show through on the reverse sides, except very slightly on the outer side of the first plate. Final forms occur of n (न) in श्रीमान् (line 14), प्रवाहान्, कुम्भान्,—रदान् (line 22), करीन्द्रान् (line 24), एतान् (line 63) and-न्द्रान् (line 64) and of (म) *m* in उत्कीरितम् (line 75), in which last instance the *virāma* is put below it.

The final form of *t* (त) is found in the following ligatures:— त्सौ (line 12), त्ष (in line 18), त्क (in line 24), त्स in (line 73). The *virāma* occurs in चारात् (112); while in several cases it has been omitted through mistake: *e.g.*, in भादोन् (line 32), तस्मात्, नगरात् (line 13) and दिक् (line 14). The *avagraha* occurs incorrectly in जित्याऽजापाम् and correctly in राज्येऽष्टाविंशतिमे (line 73). As regards the orthography, we may notice that ताम्ब्र is written for ताम्र, and सिङ्हदत्त for सिंहदत्त। The use of *v* for *b* is usual.

As this record is the longest of the four charters under notice, I give its full translation, to which reference is made for the meaning of the rest.

FULL TRANSLATION OF J.

[L. 13] Oṁ Hail! From that glorious town of Yayātinagara,—

[L. 1-4]—where the enjoyment of love is being continually intensified and still more intensified by the close embraces (of lovers), by which fatigue is removed, in which hissing sound often appears and in which hairs often stand on their ends, although such enjoyment suffers interruptions as the ardent young couple show their skill in the various processes of conjugal enjoyment with their eyes dilated (with excitement) and with their minds subdued and fascinated by amorous thoughts;

[Ll. 4-7.]—where, even in the midst of quarrels arising from jealousy, lovers, beaten by lotuses from the ears of women who have cast the beauty of the celestial damsels into shade by the greatness of their endless and peculiar charms, have all their mental anguishes roused to action by the entrance of the sharp arrows of Cupid, with their hairs standing on the ends (*lit.* sprouting up) on account of the sprinkling of the drops of sweat (from the persons of the objects of their love);

[Ll. 7-11.]—where, at the tops of houses beautifully whitewashed, the places of assignation of unchaste women and their pearl ornaments were whitened by the clusters of rays issuing from the club-like tusks of very lofty elephants—the rays which rendered the autumn moon useless in the matter of dispelling darkness;

[Lines 11-13] (and) where the fatigue of the women enjoying conjugal caresses with ardent attachment is removed by the breezes surcharged with the particles of water sent up by the breaking and swelling of the high waves of the Mahānadī.

[Lines 13-16] There was on the earth a beautiful king named Janamejaya, who had a pure and mild appearance and a lotus-like face, who had subjugated by the force of his arms all his enemies, and whose spotless fame, well known throughout the three worlds, covered the eight quarters like a canopy.

[Lines 16-18] From him sprang King Yayâti, whose glory was sung in all the three worlds, who defeated his enemies with contempt as it were, and whose sword had its sharp edge made rugged with the pearls coming out of the foreheads of the elephants rent asunder by it;

[Ll. 18-21.] whose sword rent asunder with its point the foreheads of a large number of elephants, from which heaps of pearls came out and adorned the bosom of the damsel of the earth in every battle; the dusts of whose lotus-like feet, as pure as the rays of the gems in the head-dresses of kings constantly bowing down at his doors, assumed, through equality, the lustre of these (*i.e.* the gems);

[Ll. 21-24.] who, having defeated Ajāpāla in battle, astonished the heavenly damsels by capturing alive with a smiling face, thirty-two big elephants, named Kâmadeva, etc., whose riders had been killed,—elephants who had sharp and huge tusks and whose temples were discharging *ichor* and therefore abounded with flocks of greedy bees getting intoxicated (by draughts of the fragrant fluid).

[Ll. 26-29.] The most devout worshipper of (the god) Maheśvara, the Paramabhaṭṭāraka, the Mahārājādhirāja, the Parameśvara, the ornament of the Somakula, the lord of the three Kaliṅgas, the glorious Mahâ-S'ivagupta-rāja-deva, who meditates on the feet of

[Ll. 24-27] the most devout worshipper of (the god) Maheśvara, the Paramabhaṭṭāraka, the Mahārājādhirāja, the Parameśvara, the ornament of the Somakula, the lord of the three Kaliṅgas, the glorious Mahā-Bhavaguptarājadeva,

[Ll. 29-33] being in good health and having done worship to the Brāhmans of the district at the village of Lluttarumā of Telātaṭṭa *Viṣaya* or district in Ṣaṇṇavati, issues a command to all the dependants of the king such as the *samāhatṛs* (**समाहर्तृ**),* the *sannidhātṛs* (**सन्निधातृ**), the *Niyuktāḍhikārikas* (**नियुक्ताधिकारिक**), the *Daṇḍapāśikas* (**दण्डपाशिक**), the *Piśunas* (**पिशुन**), the *Vetrikas* (**वेत्रिक**), the *Avarodhajanas* (**अवरोधजन**), the *Rāṇakas* (**राणक**), the *Rājaballabhas* (**राजवल्लभ**) &c. (in the following words) :—

[Lines 33-43]. "Be it known to you that for the enhancement of the religious merit and glory of ourselves and our parents, this village, extending to its four boundaries—with its hidden treasures and deposits, with the right to fines for the ten offences, with the freedom from all lets and hindrances, with the right to mango-trees and honey-combs, with its ditches and barren lands, with its lands and waters, with the privilege that it shall not be entered into by the regular and irregular troops—is, by a copper-plate charter, granted by us as revenue-free, with libations of water, to be enjoyed as long as the moon, the stars, the sun and the earth exist,

[Lines 37-40] to Bhaṭṭa Mahodadhi, son of Siddheśvara and grand-son of Parameśvara, an inhabitant of Ntaraḍī in the Lāvaḍā district (*viṣaya*), an immigrant from Kāsilî in the Srāvasti *Maṇḍala*, a member of the *Kanśika gotra*, with the *pravaras* Devarāta, Audala and Viśvāmitra and a student of the Gautama *śākhā*.

[Lines 43-44]. Being aware of this, you should dwell in happiness rendering unto him the rents and other shares of enjoyment due to him."

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* **समाहर्तृ**—(*Lit.* those who collected). Prob. purveyors or collectors of revenue.

सन्निधातृ—Those whose duty was to keep near. Prob. Usherers.

नियुक्ताधिकारिक—Those in charge of the Appointment Department.

दण्डपाशिक—Those whose duty was to punish the wrong-doers.

पिशुनक—Spies,

वेत्रिक—Lit. an officer who held a cane. Prob. Chamberlain.

अवरोधजन—Officers employed at the harem.

राणक—Probably a title of high distinction.

राजवल्लभ—Favourites of the king.

This my grant should be preserved like their own grants by future kings also, from a regard for religious laws and my own earnest request.

L.46. Thus it is said in religious books :—

[Lines 48-49]. Land has been given by many kings commencing with Sagara ; whoever at any time possesses the earth, to him at that time the reward accrues.

[Lines 49-50]. The giver of land enjoys happiness in heaven for 60,000 years ; while both the confiscator and the person who acquiesces in so doing go to hell.

[Lines 51-52]. Gold is the first offspring of fire ; the earth is the daughter of Viṣnu ; and the cows are born of the sun. He who gives gold and cows and lands, by him, by that act, are given all the three worlds.

[Lines 52-54]. Fathers (in the world of the dead) clap their hands upon their arms, and grand-fathers leap from joy, saying, " A giver of land has been born in our family ; he shall become our deliverer."

[Lines 54-55]. Both the giver and the receiver of land are doers of meritorious works and will certainly go to heaven.

[Lines 55-56]. A confiscator of (gifted) lands is not purified even by the excavation of a thousand of tanks, by the performance of a hundred of *vājapeya* sacrifices and by the gift of a crore of cows.

[Lines 56-57]. He who steals a piece of gold or a cow or even half-a-finger's breadth of land is consigned to hell till the destruction of the world.

[Lines 57-59]. That ignorant fool who confiscates or causes the confiscation of lands is, being tightly bound in the fetters of Varuṇa, reborn of lower animals.

[Lines 59-60]. He who confiscates lands given by himself or others becomes a worm in the ordure and stinks there with his ancestors.

[Lines 61-62]. The sun, Varuṇa, Viṣṇu, Brahmā, Soma, the god of fire and the great god S'ūlapāṇi welcome the giver of land (as he goes to heaven).

[Lines 62-63]. Rāmabhadra again and again requests all the future kings, saying, " This bridge of religion is common to all men ; it is to be observed by you in all times."

[Lines 64-66]. Thinking that wealth as well as human life are as unstable as a drop of water on the leaf of a lotus and understanding all that has been said above, men should not destroy the good works of others.

[Lines 66-69]. He who surpassed the preceptors of the kings of the gods and of the demons (*i.e.*, Vṛhaspati and S'ukrācārya) in wisdom and pride, who bore with perfect ease the heavy burden of the state affairs imposed by the king and who had both policy and prowess as his dear and constant friends,—that fortunate person of the name of (S'rī) Singhadatta (Siṃhadatta) was the holder of the post of " the minister of peace and war." (**सन्धिविग्रहपद**)

[Lines 69-71]. This charter, written by Kāyastha Sūryasena belonging to the office of (or a servant of) the 'minister of peace and war' of the Kosala country, is to last as long as the moon, the sun and the stars endure.

[Lines 71-74]. On the fifth *tithi* in the bright fortnight of the month of Bhādrapada in the 28th year of the victorious reign of the most devout worshipper of (the god) Maheśvara, the Mahārājādhirāja, the Parameśvara, the ornament of the Somakula (lunar race), the lord of the three Kaliṅgas, the glorious Yayātideva. Or, in figures, Saṃvat 28, Sudi 5.

[Lines 74-75]. Engraved by *Vināli* (Vijñānī) Madhumathana.

[Transcriptions of all the following charters are from the original plates.]

G.

FIRST PLATE.

[1] ॐ स्वस्ति । सुरसिमसमावासितश्रीमतो विजयकटकात् पर[-] मभ[-]

[2] ट्टारकमहाराजाधिराजपरमेश्वरश्रीशिवगुप्तदेवपादानुध्यात पर[-] ममा[-]

[3] हेश्वर परमभट्टारकमहाराजाधिराजसोमकुलतिलकत्र[1]कलिङ्गा- धिप[-]

[4] ति परमेश्वरश्रीमहाभंवगुप्तराजदेवः ।[2] कुष[3]ली ।[4] पोताविषय[-] प्रतिबद्धपा[-]

[5] सितलाग्रामे ब्राह्मणां[5] स[6]पूज्य तत्प्रतिनिवासिकू[7]टुम्बिजनपदा[ं]- स्तद्विषयी[-]

[6] ययथाकालाध्युसिनः समाहूत्व सन्निधात्व दाण्डपाशिक चाट भट[-]

[7] पिशून[8] वेत्रिकावरोधजनराजवल्लभादीन् सर्व्वान् राजपादोपजी[-]

[8] विनः समाज्ञापयति विदितमस्तु भवतां यथास्माभिरय[ं] ग्रामः

[9] सनिधिः सोपनिधिः सर्व्वबाधाविवर्जितः सर्वोपरिकरकरादानस[-]

[10] हितः साम्रमधुकः सगर्त्तो[ऽ]षरः प्रतिनिषिद्धचाटभटप्रवेशश्चतु[ः-]

N.B.—The letters and signs enclosed within brackets [ ] are supplied by me.

[1] Read त्रि. [2] This mark of punctuation is unnecessary.

[3] Read कुशली. [4] This mark of punctuation is unnecessary.

[5] Read ब्राह्मणान्. [6] Read संपू. [7] Read कुट. [8] Read शु.

[11] [1]सिमापर्य्यन्तः कौशिकगोत्राभ्यां ।दलदेवराज[2]विश्वामित्रप्रव[-]

[12] राभ्यां काण्वशाखाध्यायिभ्यां कोम्मापिरविनिर्गताभ्यां लोइ[-]

[13] श्टङ्गावास्तव्याभ्यां भट्टपुत्तश्री[-]

SECOND PLATE (*a*).

[14] केशवश्रीअप्पाभ्या[ं] भट्टदाद्दीसू[3]ताभ्या[ं] सलिलधारा[4]पूरः[-]

[15] सरमाचन्द्रतारकार्क्कक्षितिसमकालोपभोगार्थः श्रीदेवमाता[-]

[16] पित्रोरात्मनश्च [5]पूण्ययशोऽभिवृद्धये [6]त्ताम्रशासनेनाकरीकृ[-]

[17] त्य प्रतिपादित इत्यवगत्य समुचितभोगभागकरहिरण्यादि[-]

[18] कमुपनयद्भिर्भवद्भिः सुखेन प्रतिवस्तव्यमिति । भाविभिश्च भूप[-]

[19] तिभिर्दत्ति[7]रीयमस्मदीया धर्म्मगौरवादस्मदनुरोधाच्च स्व[-]

[20] दत्तिरिवानुपालनीया तथाचोक्त[ं] धर्म्मशास्त्रे ।

Here follow the usual verses, being thirteen in all. Twelve of these occur in Plate A (*see* Epi. Ind. III, p. 343), and for the remaining one, *see* transcription of Plate J, lines 56-57, सुवर्ण &c. The last of these verses end in the words कीर्त्तयः विलोप्याः ।

THIRD PLATE. [ll. 36-46.]

[40] कीर्त्तयः विलोप्या इति परमभट्टारकमहाराजाधिराजपरमेश्व[-]

[41] र श्रीजनमेजयदेवस्य विजयराज्ये सम्वच्छरे[8] षष्ठे ॥[9] कार्त्ति[-]

[42] कमाससितपक्षत्रयोदश्यां यत्राङ्कतः सम्वत्[10] ६ कार्त्तिक सुदि

[43] १३ लिखितमिदं शासनं महासान्धिविग्रहिश्रीमल्लदत्तश्रीधारद[-]

[44] त्तसुतप्रतिबद्धकायस्थकोइघोषेण वल्लभघोषसुतेन । प्रतिव[-]

[45] र्षं चात्र शासने करपत्त्ररूप्यप्तानि निष्टङ्क्य करशासनमिदं

[46] दत्तं यत्र रूप्य ५

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[1] Read सी. [2] Read त. [3] Read सु. [4] Read पु. [5] Read पु.

[6] Read ता. [7] Read त्रि. [8] Read संवत्सरे. [9] This mark of punctuation is unnecessary. [10] Read संवत्.

H.*

FIRST PLATE.

[1] [1]ॐ स्वस्ति । श्रीविनि[2]तपू[3]रात् कटकात्पर[म]माहेश्व[4]रपरमभ[-]
[2] ट्टारकमहाराजाधिराजश्रीमहाभवगुप्तराजदेवपा[दा]नू[5]ध्यायी ।
[8] परममाहेश्व[6]र परमभट्टारकमहाराजाधिराजपरमेश्व[7]रसो[-]
[4] मकू[8]लतिलकत्रिकलिङ्गाधिपतिश्रीमहासि[9]वगू[10]प्तराजदेवः
कू[11]स[12]
[5] लीः[13] कोसलदेशे[14] । सनूलाविषयीय तलकञ्जग्रामसम्बन्धी
[6] तु[15]रदाशानदीयनदीसमेतभूमि स्वतुःशी[16]मयाच्छिप्रे[17]
[7] वतः ब्राह्मणान्सम्पूज्य च द्विषयीयः
[8] निषिद्धचाटभटप्रवेशकस्य । गोत्रपकश्यपा[18]वत्सानैध्रु[व]प्रव[-]
[9] राय ।[19]वादशेनमध्यन्दिनश[ा]खाध्यायी[20]ने । माध्वीलविनि[र्ग]ताय
[10] कोसलजलजडुवास्तव्याय । श्रीकामदेवनाम्ने । हर्षनत्रे न[-]
[11] रसिंहसुताय [सलिलधारा] पू[21]रःसरमाचन्द्रतारकार्क्कक्षितिसम-
कालोपभो[-]
[12] गार्थं मातापित्रोरात्मनश्चपुण्ययशोऽभिवृद्धये ताम्रशासनेना[-]
[18] करीकृत्य प्रतिपादी[22]त इत्यवगत्य यथादीयमानकरहिरण्य[-]

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* This record is quite full of mistakes and omissions. The short *u* is almost throughout expressed by the long one. In the footnotes only the most salient mistakes are corrected.

[1] We have both the plain symbol as well as the letter for ॐ.

[2] Read नी. [3] Read पु for पू. [4] Read श्व. [5] Read नु।

[6] Read श्व. [7] Read श्व. [8] short u for long ū.

[9] Read शि. [10] Read short u for long ū. [11] Read short u for long ū.

[12] Read श. [13] Omit the *visarga.* [14] This sign of punctuation is unnecessary. [15] "तुर" These two letters are doubtful, and may also be read गर, नार. [16] Read सी। [17] Should probably be corrected to न्न

[18] Omit the sign for long ā. Probably the next word should be वत्सार.

[19] Should be वाजसनेयमाध्यन्दिन-। [20] Read यि. [21] Read पु.

[22] Read दि.

SECOND PLATE (*a*).

[14] भोगभागादिकं ददद्भोः[1] भवद्भिः सुखेन प्रतिवस्तव्यमिति । भावि-
भिश्चभू[-]
[15] पतिभिर्द्दर्त्ति[2]रियमस्मदीया. धर्म्मागौरवादस्मदनुरोधाचस्वदर्त्ति[3]रि]
[16] वानुपालनीया । तथाचोक्तं धर्म्मशास्त्रे

Here occur the same thirteen verses as are found on Plates G and are referred to after l. 20 of the transcripts of G. Lines 16-35 are as full of spelling mistakes as the rest of this charter (H.).

SECOND PLATE (*b*). [ll. 28-40.]

[35] परममाहे[-]
[36] श्वरपरमभट्टारकमहाराजाधिराजपरमेस्व[4]रसोमकुलति[-]
[37] लकत्रिकलिङ्गाधिपतिश्रीमद्ययातिदेवराजस्य विजयराज्ये सा[5]म्व[-]
[38] त्सराष्टमे म[6]र्गशिरमासे शुक्लपक्षे त्रयोदस्या[7]मङ्के सम्वत्[8] ८
[39] मार्ग्ग शुदि १३ लिखितमिदं ताम्रशासनं महासन्धिविग्रहिराण[-]
[40] कश्रीधारदत्तस्मा[9]वगतेन । उत्तृ[10]तासनीश्रीउच्छवणागस

THIRD PLATE.

[41] मम्फेशाह्लवसुतेन । उत्किस[ ] विज्ञानी माधवेन[11] वासुसुते-
नेति । सम्वा
[42] दोजलजपर्ग्रजलाभाजीवितं मरणसन्ततिसंस्थं भोगभुक्तीरतिनां
[43] प्रविलोक्याः कीर्त्तयो नृपतिभिर्न्नविलोप्या इति । सोभू नृपः सो[-]
[44] मकुलाब्जभानुः स्वभावतुङ्गो निजपौरुषेण । यः कोसला
[45] पालनाकौमुदिन्दु र्विजित्य चौद्याम्बिततानलच्च्याः । रामाह
[46] राघ्रिदेपवद्धभटान् सभटपेड़िप्रभृतिन् नृकुमिक

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[1] Read द्भिः [2] Omit the r-strokens. [3] Omit the r-strokens.
[4] Read श्व. [5] Read संव. [6] Read मार्ग्गो. [7] Read श्या. [8] Read संवत्।
[9] Read ख्या [10] This is doubtful, probably त्थि is to be read. If so, the correct form here would be उत्थिलासनि-। [11] Probably उत्कीर्ण विज्ञानि माधवेन is correct; the word विज्ञानी means an artist.

[47] ल्पान्तितशखं रामः । सलक्ष्मणोरामइवाप्तसे
[48] तुः । तस्मातसुते विषुरिवाजच्छिष्ट । सद्गराजम्बोघटप्रणो
[49] पर्द्दणायजईपुवत मन्यमनोदस्वाडहाणाविर्जना
[50] चकार ।

N.B.—The transcription of the third plate of H is full of doubtful points here and there : in some places, they are altogether obscure. This plate, or rather the whole record, was very hastily and carelessly inscribed.

I.

CHARTER I.

PLATE I.

[1] ॐ [1]स्वस्ति प्रेमनिरुद्धमुग्धमनसोः स्फारीभवच्चक्षुषो
[2] र्यूनोर्यत्र विचित्रनिर्भररतक्रीड़ाक्रमं तन्वतोः । विच्छिन्नो
[3] पि कृतातिमात्रपुलकैराविर्भवत्सीत्कृतैराश्लेष'ग्ल[']पितक्र[-]
[4] मैः स्मररसः कामं मुहुस्ताय्यते ॥ [2]यत्राशेषविशेषरूप[-]
[5] महिमापास्ताप्सरःकान्तिभिर्जातेर्ष्याकलहेष्वपि प्रणयिनः
[6] कर्णोत्पलैस्ताड़िताः । जायन्ते प्रविशच्छितस्मरशरप्रोत्थापि[-]
[7] तान्तर्व्यथा[:] स्यन्दिस्वेदजलावसेचनवशान्निर्यातरोमा[-]
[8] ङ्कुराः ॥ [2]अत्युत्तुङ्गकरीन्द्रदन्तमुसलप्रोद्भासिरोचिश्चयै
[9] र्द्ध्वान्तध्वन्सन[3]निष्फलीकृतशरच्चन्द्रोदयैः सर्व्वदा [।] यत्रासौ
[10] दसतीजनस्य विशदं मुक्तामयं मण्डनं सङ्केतास्पदमप्यतीवध[-]
[11] वलप्रासादशृङ्गाग्रतः ॥ [4]महानदीतुङ्गतरङ्गभङ्गा[5]स्फारोच्छ[-]
[12] लच्छीकरवद्भिरारात् । यस्मिन्नतासक्तिमदङ्गनानां श्रमापनोदः
[13] क्रियते मरुद्भिः ॥ तस्मात् श्रीययातिनगरात् ॥ [6]लोकत्रयप्रथि[-]
[14] तशुभ्रयशोवितानव्याप्ताष्टदिक्प्रसभनिर्जितवैरिवर्गः । राजा

N.B.—The letters and signs enclosed within brackets [ ] are supplied by me.

[1] Read घे. [2] Metre : Śārdûlavikriḍita. [3] Read ध्वंसन. [4] Metre : Upajati of Indravajrâ and Upendravajrâ. [5] Omit the sign of long â.
[6] Metre : Vasantatilaka.

[15] बभूव भुविभावित भव्यमूर्त्तिः श्रीमान्सरोजवदनो जनमेजया[-]

[16] ख्यः ॥ [1]निर्द्दारितारिकरिकुम्भसमुद्गमुक्तमुक्ताफलप्रकरदन्तुरखड्ग[-]

PLATE II (*a*).

[17] धारः । तस्मादजायत जगत्त्रयगीतकीर्त्तिर्हेलाविनिर्ज्जितरिपुर्नृप[-]
तिर्य[-]

[18] यातिः । [2]मद्योल्लोलालिमालाकुलकरटपुटस्यन्दिदानप्रवाहान्
सिन्दुरार[-]

[19] त्कुम्भान् श्रितपृथुलरदान् कामदेवादिस[3]ज्ञान् । जित्वाऽजापाल[-]
माजौ ज[-]

[20] नितसुरवधूविस्मयः स्मेरवक्त्रः स [4]द्वात्रिंशत्करीन्द्रान् शरनिकर[-]
हतारो[-]

[21] हक[ा]नग्रहीद्यः ॥ परममाहेश्वरपरमभट्टारकमहाराजाधिराज[-]
पर[-]

[22] मेश्वर सोमकुलतिलकत्रिकलिङ्गाधिपतिश्रीमहाभवगुप्तराजदेव[-]

[23] पादानुध्यातपरममाहेश्वर परमभट्टारकमहाराजाधिराजप[-]

[24] रमेश्वर सोमकुलतिलकत्रिकलिङ्गाधिपतिश्रीमहाशिवगु[-]

[25] प्तराजदेवः कुशली । कोसलदेशे तेलातटविषये

[26] डेलाडेलीग्रामे ब्राह्मणान्सम्पूज्य तद्विषयीय यथाकाला[-]

[27] ध्यासिनः समाहर्त्तृसन्निधातृनियुक्ताधिकारिक दण्डपाशिक चट्ट[-]

[28] भट्टपिशुन[5] वेत्रकावरोधजन राज्ञीराजपुत्त्रराणकराज[-]

[29] वल्लभादीन् सर्वान्राजपादोपजीविनः समाज्ञापयति वि[-]

[80] दितमस्तु भवतां यथास्माभिरयं ग्रामः सनिधिः सोपनिधिः

[81] सदशापराधः सर्व्वबाधाविवर्ज्जितः सर्व्वोपरिकरादानसहि[-]

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[1] Metre : Vasantatilaka.

[2] Metre : Sragdhara.

[3] Read संज्ञान्.

[4] Read सद्द्वात्रिंशत् as in J.

[5] Read वेत्रिका ।

PLATE II (*b*).

[32] तः । चतुःसीमापर्य्यन्तः साम्रमधुकः सगर्त्तोषरः सजलस्थ[-]
[33] लः प्रतिनिषिद्धचट्टभट्टप्रवेशः कौशिकगोत्राय देवरात[-]
[34] [1]औदलविश्वामित्रप्रवराय गौतमशाखाध्यायिने श्रावस्तिम[-]
[35] ण्डले कासिलीविनिर्गताय लावडाविषय[ा]न्तरडिवास्तव्याय
[36] परमेश्वरनप्त्रे सिद्धेश्वरसुताय भट्टश्रीमहोदधये उ[-]
[37] दकधारापुरःसरं आचन्द्रतारकार्क्कक्षितिसमकालोपभोगा[-]
[38] र्थं मातापित्रोरात्मनश्च पुण्ययशोऽभिवृद्धये ताम्रशास[-]
[39] नेनाकरीकृत्य प्रतिपादित इत्यवगम्य समुचितभाग[-]
[40] भोगकरहिरण्यादिप्रत्यायमुपनयद्भिर्भवद्भिः सुखे[-]   गौ[-]
[41] न वस्तव्यमिति [।] भाविभिश्च भूपतिभिर्दत्तिरियमस्मदीया धर्म्म-
[42] रवादस्मदनुरोधाच्च स्वदत्तिरिवानुपालनीया [।] तथाचोक्तं धर्म्म[-]
[43] शास्त्रे

N.B.—Here occur the usual verses, for which see lines 47–66 of the text of J below.

PLATE III.

[59] परममाहेश्वर परमभट्टारकमहाराजाधिराजपरमेश्व[-]
[60] र सोमकुलतिलक त्रिकलिङ्गाधिपतिश्रीमद्ययातिदेवपादप्र[-]
[61] वर्द्धमानविजयराज्यचतुर्व्विंङ्शतिसम्वत्सरे[2] आषाढ़शुक्लपक्षे ति-
[62] थौ पञ्चम्यां यत्राङ्केनापि सम्वत्[3] २४ आषाढ़ सुदि ५ लिखित[-]
मिदं शा[-]
[63] सनं महासान्धिविग्रहिराणकश्रीधारदत्तावगतेन महासान्धिविग्रहि-
[64] कायस्थ तथागतेनेति विनाग्नि[4] वासुकेनो[5]त्कारितम् ॥

N.B.—The letters and signs enclosed within brackets [ ] are supplied by me.

[1] For देवरात औदल read देवरातौदल. There is a sign above य, which may stand for the e- sign. [2] Read चतुर्विंशति संवत्सरे। [3] Read संवत् [4] Read विज्ञानि. [5] Read -त्कीर्णम् ॥

J.

FIRST PLATE.

[1] ॐ[1] [2]स्वस्ति प्रेमनिरुद्धमुग्धमनसोः स्फारीभवच्चक्षुषो

[2] र्यूनो र्यत्र विचित्रनिर्भररतक्रीड़ाक्रम[ं] तन्वतोः[।] विच्छिन्नोपि कृता [-]

[3] तिमात्रपुलकैराविर्भवत् सीत्कृतैराश्लेषैर्ग्लपितक्लमैः स्मरर[-]

[4] सः काम[ं] मुहुस्ताय्यते ॥ [3]यत्राशेषविसे[4]षरूपमहिमापास्ता[-]

[5] प्सरःकान्तिभिर्ज्ज[ा]तेर्ष्याकलहेष्वपि प्रणयिनः कर्णोत्पलै[-]

[6] स्ताड़िताः[।]जायन्ते प्रविशत्सत[5]स्मरशरप्रोत्थापितान्तर्व्यथा[ः] स्यन्दी[ ][6]

[7] स्वेदजलावसेचनवशान्निर्यातरोमाङ्कुराः ॥ [7]च्या[8]त्युत्तुङ्गक[-]

[8] रीन्द्रदन्तमुसलप्रोद्भासिरोचिश्चयैर्ध्वान्तध्वन्सन[9]निष्फ[-]

[9] लीकृतशरच्चन्द्रोदयैः सर्व्वदा [।] यत्रासीदसतीजनस्य

[10] विशदं मुक्तामयं मण्डनं सङ्केतास्पदमप्यतीवध[-]

[11] वलप्रासादशृङ्गाग्रतः ॥ महानदीतुङ्गतरङ्गभङ्गस्फा[-]

[12] रोच्छलत्सीकरवद्भिरारात् [।] यस्मिन्ननाशक्तिमदङ्गनानां श्रमा[-] पनो[-]

[13] दः क्रियते मरुद्भिः ॥ तस्मात् श्रीययातिनगरात् । [10]लोकत्रयप्र[-]

[14] थितशुभ्रयशोवितानव्याप्ताष्टदिक्प्रसभनिर्ज्जितवैरिवर्गः ।

[15] राजा बभूव भुवि भावितभव्यमु[11]र्त्तिः श्रीमान्सरोजवदनो जनमे[-]

[16] जयाख्यः [12]निर्द्दारितारिकरिकुम्भसमुद्धृ[illegible]मुक्ताफलप्रकरद[-]

[17] [13]न्तरखड्गधारः [।]तस्मादज[ा]यत जगत्र[14]यगीतकीर्त्तिर्हे[ं]ला[-] विनिर्ज्जित[-]

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[1] Represented by a symbol. [2] Metre: शार्द्दूलविक्रीड़ित.

[3] Metre: शार्द्दूलविक्रीड़ित. [4] Read शे. [5] Read प्रविशच्छित।

[6] Read स्यन्दि. [7] Upajāti of Indravajrá and Upendravajrâ.

[8] Read च्यु for च्या [9] Read ध्वंसन। [10] Metre: Sardûlavikrîdita.

[11] Read मूर्त्ति. [12] Metre: Sardûlavikridita. [13] Read न्त। [14] Read त्रय.

SECOND PLATE (*a*).

[18] रिपुर्न्नृपतिर्य्ययातिः । [1]यत्खड्गाग्रविपाटितद्विपघटाकुम्भस्थ[-]
[19] लादुल्लसन्मुक्ताजालविभूषितं प्रतिरणं पृथ्वीवधूरःस्थलं । शश्व[-]
[20] द्द[ा]रनमन्नराधिपशिरोरत्ना[ं]शुजालामला[ः ।] यत्पादाम्बुजरेणवः सम[-]
[21] तया तदखिललक्ष्मीं दधुः ॥ [2]माद्यत्को[3]लालिमालाकुलकरटपुटस्य[-]
[22] न्दिदानप्रवाहान् सिन्दुरारक्तकुम्भान् [4]शितपृथुलरदान् काम[-] देवादि[-]
[23] संज्ञान् जित्वा[5]ऽजापालमाजौ जनितसुरवधूविस्मयःस्मेरवक्त्रः स [-]
[24] द्वात्रिंशत्करीन्द्रान् शरनिकरहतारोहकानग्रहीद्यः ॥ परममा[-]
[25] हेश्वर परमभट्टारक महाराजाधिराजपरमेश्वरसोमकुल[-]
[26] तिलकत्रिकलिङ्गाधिपतिश्रीमहाभवगुप्तराजदेवपादानु[-]
[27] ध्यातपरममाहेश्वरपरमभट्टारकमहाराजाधिराजप[-]
[28] रमेश्वर सोमकुलतिलकत्रिकलिङ्गाधिपतिश्रीमहाशिवगुप्त[-]
[29] राजदेवः कुशली । [6]षम्मवत्यां तेलातट्टविषयीयल्लुत्तरमा[7]
[30] ग्रामे तद्विषयीयब्राह्मणानापूज्य समाहर्तृसन्निधातृनियु [-]
[31] क्ताधिकारिक दण्डपासि[8]कपिशुनवेत्रिकावरोधजनराण[-]
[32] कराजवल्लभादीन् सर्व्वान्राजपादोपजीविनः समाज्ञापय[-]
[33] ति विदितमस्तु भवतां यथास्माभिरयं ग्रामः सनिधिः सोप[-]
[34] निधिः सदशापराधः सर्व्वबाधाविवर्ज्जितः सर्व्वोपरिकरादा[-]
[35] नसहितः ।[9] चतु[illegible]र्यन्तः साम्रमधुकः सगर्त्तोष [-]

SECOND PLATE (*b*).

[36] र[ः]सजलस्थलः प्रतिनिषिद्धचट्टभट्टप्रवेशः कौशि[-]
[37] कगोत्राय देवरात[10]औदलविश्वामित्रप्रवराय गौतमशा[-]

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[1] Metre : Sārdūlvikrīḍitam. [2] Metre vasantatilaka. [3] Read को.

[4] Read सित । [5] Read जित्वा. [6] This mark of punctuation is unnecessary. [7] Read य. [8] शि. [9] This mark of punctuation is unnecessary.

[10] Instead of तऔ read तौ ।

[38] स्वाध्यायिने श्रावस्तिमण्डले कासिलीविनिर्गताय लावडांवि[-]

[39] षयेन्तरडीवास्तव्याय परमेश्वरनप्त्रेसिद्धेश्वरसुता[-]

[40] य भट्टश्रीमहोदधये उदकधारापुरःसर[म्]आचन्द्र[-]

[41] तारकार्कक्षितिसमकालोपभोगात्थं [1]मातापित्रोरात्मन[-]

[42] स्य पुण्ययशोऽभिवृद्धये ताम्र[2]शाशनेनाकरीकृत्य प्रतिपादि[-]

[43] त इत्यवगत्य समुचितकरनिकरभोगभागादिकमु[-]

[44] पनयद्भिर्भवद्भिः सुखं प्रतिवस्तव्यमिति ॥ भाविभि[-]

[45] स्य भूपतिभिर्दत्तिरियमस्मदीया धर्म्मगौरवादस्मदनु[-]

[46] रोधाच्च स्वदत्तिरिवानुपालनीया ॥ तथा चोक्तं धर्म्मशास्त्रे बहुभि

[47] व[ ]सुधा दत्ता राजभिः सगरादिभिः । यस्य यस्य यदा भूमिस्तस्य त[-]

[48] स्य तदा फलं ॥ [3]मा भूदफलशङ्का वः परदत्तेति पार्थिवाः स्वदा[-]

[49] नात् फलमानन्त्यं[4] परदत्तानुपालने ॥ [5]षष्ठि[6]म्वर्षसहस्राणि स[-]
[व]

[50] र्गे मोदति भूमिदः । आच्छेत्ता चानुमन्ता च दयमेव नरकम्ब्र[-]

[51] जेत् ॥ [7]अग्नेरपत्यं प्रथमं सुवर्णं भूर्वैष्णवी सूर्यसुत[ा]श्च गावः यः

THIRD PLATE (*a*).

[52] काञ्चनं गाश्च महीञ्च दद्यात् [।] दत्ता स्त्रयस्तेन भवन्ति लोके[8]॥ [9]आस्फो[-]

[53] टयन्ति पितरो वल्गयन्ति पितामहाः[10] ॥ भूमिदाता कुले जातः

[54] स नस्त्राता भविष्यति [।] [11]भूमिं यः प्रतिगृह्णाति यश्च भूमिं प्रयच्छ[-]

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[1] Read— भोगार्थं । [2] Read ताम्रशासनेना- । [3] Metre: Anushtubh.

[4] May be corrected to मानन्त्यं as Fleet has done. But I think मानन्त्य also may be retained meaning "longlasting," especially as all the versions shew this form.

[5] Metre: Anushtubh. [6] Read षष्ठिवर्षं । [7] Metre: Indravajrâ.

[8] Read लोकाः [9] Metre Anushtubh. [10] Omit one perpendicular.

[11] Metre: Anushtubh.

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[55] ति [।] उभौ तौ पुण्यकर्म्माणौ नियतं स्वर्गगामिनौ [॥] [1]तड़ागानां सहस्रेण

[56] वाजपेयशतेन च [।] गवां कोटिप्र[दा]नेन भूमिहर्त्ता न शुध्यति । [2]स्वर्ण[3]मेकं गामेकां

[57] भूमेरप्यर्द्ध[4]मङ्गुलं [।] हरन्नरकमायाति यावदाह्लत[5]संप्लवं ॥ [6]अन्यायेन

[58] हृता भूमिरन्यायेन तु हारिता [।] हर्त्ता हारयति[7] यस्तु मन्दबुद्धिस्तमोवृतः । सु[-]

[59] बद्धो वारुणैः पाशैस्तिर्य्यग्योनिं स गच्छति [॥] [8]स्वदत्तापरदत्तां वा

[60] [9]जो हरेत वसुन्धरां स विष्ठायां कृमिर्भूत्या[10] पितृभि[ः] सह पच्यते ॥ [11]आ[-]

[61] दित्तो[12] वरुणो विष्णु[13]ब्रह्मा सोमोऊतासनः [14] [।] शूलपा[-]

[62] णिश्च भगवानभिनन्दन्ति भूमिदं । [।] [15]सामान्यो [ऽ]य[ं] धर्म्मसे[-]

[63] तुर्न्नृपाणां काले काले पालनीयो भवद्भिः ॥ सर्व्वानेतान् भावि[-]

[64] नः पार्थिवेन्द्रान् भूयो भूयो याचते रामभद्रः । [16]इति कमल-

[65] दलाम्बुविन्दुलोलां श्रियमनुचिन्त्य मनुष्यजीवितञ्च [।] सकल-मिद[-]

[66] मुदाहृतञ्च बुद्धा नहि पुरुषैः परकीर्त्तयो विलोप्याः [।] [17]येनात्यन्त[-]

[67] सुरासुराधिपगुरुप्रज्ञाभिमानो जितो राज्ञारोपितराज्यभारम[-]

[68] तुलं यश्चावहल्लीलया [।] यस्यासीन्नयविक्रमद्वयमपि [18]प्रेयां-सखास[-]

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[1] Metre : Anushtubh. [2] Metre : Anushtubh. [3] Read सुवर्ण.
[4] Read द्व. [5] Read भू. [6] This sloka has six feet : metre अनुष्टुभ.
[7] Read -यिता. [8] Metre : Anushtubh. [9] Read यो. [10] Read त्वा.
[11] Metre : Anushtubh. [12] Read त्वा [13] Read -ष्णुर्ब्र- । [14] Read शनः
[15] Metre : S'âlinî. [16] Metre : Pushpitāgrâ. [17] Metre Sardûlavikrîḍita
[18] Read न् for *anusvâra*.

[69] र्व्वदा स श्रीमान्धृतसान्धिविग्रहपदः श्रीसिह्वदत्ताह्वयः [॥]
कोसलीयसन्धिविग्रही[1] सता[2]क

THIRD PLATE (*b*).

[70] कायस्थ सूर्यसेनेन लिखितं शासनं स्थास्नु यावच्चन्द्रार्कता[-]
[71] र्कं ॥ परममाहेश्वर परमभट्टारकमहाराजाधिराजपरमे[-]
[72] श्वर सोमकुलतिलकत्रिकलिङ्गाधिपति श्रीमद्ययातिदेवस्य प्र[-]
[73] वर्द्धमानविजयराज्येऽष्टाविंशतिमे सम्वत्सरे[3] भाद्रपदमासे
[74] सितपक्षे तिथौ पञ्चम्यां यत्राङ्केपि सम्वत् २८ भाद्रपद
[75] सुदि ५ शिवं ॥ [4]विनानी मधुमथनेनोत्कीरितम्[5] ॥

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[1] Probably **कोसलीयसन्धिविग्रहिसत्ताक** is the correct expression, meaning "belonging to the office of the minister of peace and war of the Kosala country."

सताक—The sign of **त्ता** is not very distinct; it looks more like the sign of a full stop. The word must, however, be either **सत्तक** or **सत्ताक**. It is derived most probably from root **सत्**. It is equivalent in meaning to **प्रतिबद्ध** in line 42 of A, line 47 of B, line 40 of G. The three letters may also be read as **सवक**, a mistake for **सेवक**, a servant.

[3] Read **संवत्सरे।** Read—**कोणाम्**

[4] E, F and H have **विज्ञानी**, which is probably the correct form. This was probably an official title. I has **विननि**.

[5] Read **कीर्णम्।**

FEBRUARY, 1905.

The Annual Meeting of the Society was held on Wednesday, the 1st February, 1905, at 9-30 P.M.

HIS EXCELLENCY LORD CURZON, G.M.S.I., G.M.I.E., Patron, in the chair.

The following members were present :—

Dr. A. G. Allan, Mr. N. Annandale, Mr. J. Bathgate, Rev. P. O. Bodding, Babu Monmohan Chakravarti, Mr. B. L. Chaudhuri, Mr. W. R. Criper, Mr. J. N. Das-Gupta, Mr. W. K. Dods, Mr. F. Doxey, His Honour Sir A. H. L. Fraser, Mr. N. L. Hallward, Mr. T. H. Holland, Mr. D. Hooper, Dr. W. C. Hossack, Mr. G. W. Küchler, Mr. C. W. McMinn, Mr. J. Macfarlane, Mr. E. D. Maclagan, Kumar Ramessur Maliah, The Hon. Mr. Justice F. E. Pargiter, Mr. W. Parsons, The Hon. Mr. A. Pedler, Kumar Satindradev Rai Mahasai, Dr. P. K. Ray, Mr. H. H. Risley, Captain L. Rogers, I.M.S., Dr. E. D. Ross, Pandit Yogeśa Chandra Sastree, Mahamahopadhyaya Haraprasad Shastri, Mr. H. E. Stapleton, Pandit Satis Chandra Vidyabhushaṇa, Mr. E. Vredenburg, Mr. W. H. Arden Wood, Mr. J. Wyness.

Visitors :—Mr. R. E. V. Arbuthnot, Miss B. Buckland, Mr. H. Chandler, Mr. E. C. Cotes, Mr. A. F. Cousins, Rev. J. Dahlmann, S.J., Lady Fraser, Babu Devabrata Mukhopadhyaya, Kumar Manindradev Rai Mahasai, Mr. S. C. Sanyal, Mr. G. Stapleton, Rev. A. Willifer-Young.

According to the Rules of the Society, the President ordered the voting papers to be distributed for the election of Officers and Members of Council for 1905 and appointed Messrs. G. W. Küchler and N. L. Hallward to be scrutineers.

The President announced that the Trustees of the "Elliott Prize for Scientific Research" had awarded the prize for the year 1904 to Babu Sarasi Lal Sarkar, and read the following report of the Trustees :—

Report on the Elliott Prize for Scientific Research for 1904.

The Trustees have received Essays from the following competitors for the prize :—

1. *On the crystalline properties of a potassium copper ferrocyanide compound. Parts I & II.—By* SARASI LAL SARKAR, M.A.

2. *On the experimental determination of the Electro-chemical equivalent of nickel. (With diagrams.).—By* SURENDRA NATH MAITRA, M.A.

3. *On a complete investigation of a Phenomenon taking place beyond the critical angle.—By* JAGADINDRA ROY.

4. *Essay on metal soaps.—By* AKSHAYA KUMAR MAJUMDAR, M.A.

5. *An Essay on the results of "Original Researches" (made during 1903-04) leading to the discovery of a cheap and simple chemical process for the extraction and cleaning of fibre from plantain and banana stalks easily adoptable for the development of a profitable industry by all classes of people in Bengal or in any place in India.—By* MANINDRANATH BANERJEE.

6. *On the Hindu method of manufacturing spirit from rice and its scientific explanation.—By* JOGES CHANDRA ROY.

The Trustees, after consulting experts as provided in the scheme, adjudge the prize for the year 1904 to Babu Sarasi Lal Sarkar, M.A.

F. E. PARGITER,
President, Asiatic Society of Bengal.

ALEX. PEDLER,
Director of Public Instruction, Bengal,
AND
Vice-Chancellor, Calcutta University.

CALCUTTA,
30th January, 1905.

The President also announced that the Barclay Memorial Medal for the year 1904 had been offered to Lt.-Col. D. D. Cunningham, F.R.S., C.I.E., I.M.S., (retired).

The President then called upon the Secretary to read the Annual Report.

ANNUAL REPORT FOR 1904.

The Council of the Society have the honour to submit the following Report on the state of the Society's affairs during the year ending 31st December, 1904.

Member List.

During the year under review, 39 Ordinary Members were elected, 8 withdrew, 5 died, and 18 were removed from the list, *viz.:* 6 under Rule 38, as defaulters; 9 under Rule 40, being more than 3 years absent from India; and 3 under Rule 9, not having paid their entrance fees. The election of one member was cancelled at his own request as he was not prepared to join the Society at once. Of the members elected, 2 were old members who rejoined. The total number of members, at the close of 1904, was thus 343 against 335 in the preceding year. This is higher than that of any year on record. Of these 132 were Resident, 130 Non-Resident, 14 Foreign, 21 Life, and 45 absent from India; and one a Special Non-Subscribing Member, as will be seen from the following table, which also shows the fluctuations in the number of Ordinary Members during the past six years:—

YEAR.	PAYING.				NON-PAYING.				GRAND TOTAL.
	Resident.	Non-Resident.	Foreign.	Total.	Life.	Absent.	Special Non-Subscribing.	Total.	
1899	120	119	13	252	21	27	1	49	301
1900	116	124	18	258	22	30	1	53	311
1901	123	133	13	269	22	36	1	59	328
1902	126	126	14	266	21	46	1	68	334
1903	127	126	15	268	21	45	1	67	335
1904	132	130	14	276	21	45	1	67	343

The five Ordinary Members, whose loss by death during the year we have to regret, were Dr. U. C. Mukerjee, Mr. A. T. Pringle, Mr. H. M. Rustomjee, Dr. Mahendralal Sircar and Dr. C. R. Wilson.

There was one death amongst the Honorary Members, *viz.*, Dr. Otto von Böhtlingk. To fill this vacancy and others previously existing, the Society on the recommendation of the Council elected as Honorary Members, Professor H. Kern, Professor Ram Krishna Gopal Bhandarkar, Professor M. J. DeGoeje, Professor Ignaz Goldziher, Sir Charles Lyall, Sir William Ramsay, and Dr. G. A. Grierson.

The List of Special Honorary Centenary Members and Associate Members continued unaltered from last year; their numbers standing at 4 and 13 respectively.

Intimation was received of the death of Dr. Emil Schlagintweit, the only Corresponding Member of the Society.

No members compounded for their subscription during the year.

Indian Museum.

There was only one change amongst the Trustees; it was caused by the death of Dr. Mahendralal Sircar, and Mr. J. Macfarlane was appointed to fill the vacant place.

The other Trustees who represent the Society have been :—

The Hon. Mr. A. Pedler, C.I.E., F.R.S.
G. W. Küchler, Esq., M.A.
T. H. Holland, Esq., F.G.S., F.R.S.
The Hon. Sir J. A. Bourdillon, K.C.S.I.

Finance.

The accounts of the Society are shown in the Appendix under the usual heads, and besides in this year's account there is an additional statement under the head "Arabic and Persian Manuscripts." Statement No. 9 contains the Balance Sheet of the Society and of the different funds administered through it.

The financial position of the Society shows an improvement, and the credit balance at the close of the year amounts to Rs. 1,92,939-7-5, which is more than eleven thousand rupees in advance of last year, and is chiefly due to the special Government grant of Rs. 10,000.

The Budget for 1904 was estimated at the following figures :— Receipts Rs. 17,700; Expenditure Rs. 25,374-4 (Ordinary Rs. 17,254-4; Extraordinary Rs. 8,120.) Taking into account only the ordinary items of receipts and expenditure for the year 1904, the actual results have been :—Receipts Rs. 30,368-13-8; Expenditure Rs. 14,134-0-7, showing a balance (after setting aside the special grant of Rs. 10,000) in favour of the Society on its ordinary working of Rs. 6,234-13-1. Against this balance, there have been several extraordinary items of expenditure amounting to Rs. 5,182-8-10; the net balance is Rs. 1,052-4-3. There is a Temporary Investment of Rs. 48,300, at the close of the year, out of which Rs. 33,259-5-7 is in favour of the Society, Rs. 5,097-1-3 Oriental Publication Fund, Rs. 3,578-0-5 Sanskrit MS. Fund, and Rs. 6,365-8-9 Arabic and Persian MS. Fund. In addition to this, a sum of Rs. 1,088 has been added to the Reserve Fund from entrance fees paid during the year.

There is an increase in receipts under every head except "Miscellaneous," which has fallen off very slightly.

The ordinary expenditure was estimated at Rs. 17,254-4-0, but the amount paid out was only Rs. 14,134-0-7. The principal items in excess were "Postage," "Freight," "Books," "Proceedings," and the increase was caused by larger transactions and the payment of outstanding printing charges and of Messrs. Luzac and Co's account from April 1902 to October 1904. The actual expenditure on the Journals was Rs. 3,673, against a budget provision of Rs. 6,200. The balance is due on outstanding printing bills.

There were three extraordinary items of expenditure during 1904 under the heads "Furniture," "Pension" and "Building" not provided for in the Budget. New furniture was required, the lavatory arrangements were improved, and on the retirement of the Cashier, a pension of Rs. 112, at the rate of Rs. 20 per month; has been paid to him, and in his place Babu Asutosh Dhur has been appointed.

The expenditure on the Royal Society's Catalogue (including subscriptions sent to the Central Bureau) has been Rs. 5,842, while the receipts under this head from subscriptions received on behalf of the Central Bureau (including the grant from the Government of India) Rs. 5,352. A sum of Rs. 610 is due to the Central Bureau and will be sent.

Four extraordinary items of expenditure were budgetted for. Out of the sum of Rs. 1,000 for the salary of the Assistant engaged in revising the Library Catalogue, Rs. 81 only have been spent, as his services have been dispensed with. Rs. 1,800 were assigned for cleaning, varnishing and relining the Society's pictures, and Rs. 1,306 have been spent; but a sum of Rs. 500 which had been advanced to the late Mr. A. E. Caddy, for cleaning the pictures, has been written off as unrecoverable on his death, and Rs. 566 have been spent on the freight, etc., due on the frames which were procured from England, while their cost has yet to be paid. Rs. 2,320 were paid for renewing the floor of the entrance hall, which is now greatly improved, and Rs. 366 were spent in additions to the lavatory arrangements.

The Budget Estimate of Receipts and Disbursements for 1905 has been fixed as follows:—Receipts Rs. 18,100, Expenditure Rs. 17,654. The item "Rent of Rooms" has been increased, as one room has been rented to the Automobile Association of Bengal at Rs. 50 per month. On the expenditure side, the items "Freight" and "Journal Part III" have been increased, as greater activity is expected. "Insurance" has been reduced by half owing to the removal of the Photographic Society of India. The item, "Registration Fees" has been omitted, as under the Act no fee will be charged for filing copies of the Society's papers. There is a new item of Rs. 192 under the head "Pension."

Three extraordinary items of expenditure have been budgetted for during the year 1905, namely, Rs. 1,000 for the new Library Catalogue, Rs. 2,809 for reframing the pictures, and Rs. 1,220 for white-washing and colourwashing part the Society's premises. Besides these provisions, the application of the special grant of Rs. 10,000 from the Government towards the thorough repair and improvement of the Society's premises is under careful consideration.

BUDGET ESTIMATE FOR 1905.

Receipts.

	1904. Estimate.	1904. Actuals.	1905. Estimate.
	Rs.	Rs.	Rs.
Subscriptions	7,500	8,719	7,800
Sale of Publications ...	600	1,053	600
Interest on Investments ...	6,000	6,787	6,000
Rent of Rooms	500	730	600
Government Allowances ...	3,000	13,000	3,000
Miscellaneous	100	80	100
Total ...	17,700	30,369	18,100

Expenditure.

	Rs.	Rs.	Rs.
Salaries	3,800	3,460	3,800
Commission	425	376	425
Pension	...	...	192
Stationery	120	134	120
Lighting and Fans ...	320	218	320
Municipal Taxes	884	884	884
Postage	500	567	500
Freight	75	129	100
Meetings	100	105	100
Contingencies	500	459	500
Books	2,000	2,135	2,000
Binding	700	599	700
Journal, Part I	2,100	1,437	2,100
" " II	2,100	1,381	2,100
" " III	2,000	855	2,500
Proceedings	600	753	600
Printing Circulars, &c. ...	200	200	200
Registration Fee	5	...	...
Auditor's Fee	100	100	100
Petty Repairs	100	29	100
Insurance	625	313	313
	17,254	14,134	17,654

Extraordinary Expenditure.

	1904. Estimate.	1904. Actuals.	1905. Estimate.
Library Catalogue ...	1,000	81	1,000
Royal Society's Catalogue ...	...	5,842	...
Cleaning and Varnishing Pictures	1,800	1,306	...
Picture Frames	3,000	566	2,809
Repairs	2,320	2,686	...
Furniture	...	354	...
Pension	...	112	...
Building	...	78	1,220
	8,120	11,025	5,029

Agencies.

The Council has transferred the London Agency of the Society—from Messrs. Luzac & Co. to Mr. Bernard Quaritch, 15 Piccadilly.

During the year no publications have been sent to Messrs. Luzac & Co., pending the settlement of the question of Agency, but from them we have received books and papers of the value of £28-13-5. They have submitted a statement of their accounts to the end of October 1904, and the balance of £36-6-11 due to them has been remitted in full settlement of their account.

Two consignments of publications have been sent to Mr. Quaritch since his appointment as the Society's London Agent, amounting to £60-17 and Rs. 533-2, being value of 480 copies of the various issues of the Journals and Proceedings and of 741 fasciculi of the Bibliotheca Indica, respectively.

Our Continental Agent is Mr. Otto Harrassowitz, to whom we have sent publications valued at £19-17-6 and Rs. 560-8, of which £19-14-4 and Rs. 229-11-9 worth have been sold for us.

Library.

The total number of volumes or parts of volumes added to the Library during the year was 2,949, of which 675 were purchased and 2,274 presented or received in exchange for the Society's publications.

The MS. of the new edition of the Society's Library Catalogue, after careful revision by the members of the Library Committee, was sent to the Press at the beginning of January 1905.

The Government of India, with the assent of the Council, decided to publish a combined subject-index of the books in European languages in the Society's Library and the Imperial Library. This is expected to be in print early in 1906.

In continuation of the Council order, the Imperial Library has been allowed to borrow books and MSS. from the Society for the use of its readers until the end of August 1905. During the period from 28th January to 31st December, 1904, 26 books and 5 Manuscripts have been thus borrowed.

In connection with the proposed rejection of certain books from the Society's Library, the General Meeting resolved (1) that the books weeded out by the Committee be rejected and disposed of, the Medical works being placed in a collection by themselves; (2) that the best way of disposing of them is by sale, and that they be accordingly offered for sale; (3) that the first offer be made to the Imperial Library, and that, if it purchases any of these books, the prices of the books be settled between the Council and that Library according to the price-catalogues of Quaritch and other booksellers; (4) that the next offer be made to the Calcutta University, the Presidency and other Colleges and the Medical College, and that the prices of books bought by them be settled similarly; (5) that the remainder of the rejected books be disposed of by public auction under some arrangement by which members and others can bid, and by which real prices may be obtained if possible; and (6) that all books rejected and disposed of be first stamped plainly and indelibly with a special stamp.

International Catalogue of Scientific Literature.

During the year, the two remaining volumes of the first annual issue and the volumes of the second annual issue, with the exception of the volumes on Chemistry, Meteorology, Botany and Zoology have been received and distributed.

Of the third annual issue the volumes on Physics and Astronomy have been published but have not yet been received.

A great falling off among subscribers for the second and subsequent issues has to be here recorded. The Agent to the Governor-General in Rajputana (four sets), the Agent to the Governor-General in Central India (two sets), the Bombay University Library (one set) and the Native General Library, Bombay (one set), are the most important; special part subscribers have in three instances discontinued their subscriptions.

The Director at the Central Bureau was informed of the number of copies thus left in hand, and he advised that they should be returned to London. The books have been packed up and will be sent off soon.

All the subscriptions for the first annual issue, with two or three exceptions, have been received. A sum of £340, representing subscriptions for 20 complete sets, and another sum of £17-15-0 for special parts, have been remitted to the Central Bureau during the year.

The sanction of the Government of India was obtained during the year to the expense of postage in the distribution of the Catalogue being met from the grant.

Owing to the illness of the clerk during three months of the year a number of index slips were left over; these after being checked by the experts will be despatched shortly. The number of slips sent to London was 71.

Mr. W. D. Wright was appointed Clerk attached to the Regional Bureau of the Royal Society in the place of Mr. J. B. Richardson, resigned.

Elliott Prize for Scientific Research.

A sum of Rs. 1,000 out of the accumulated interest on account of the Elliott Prize Fund in the hands of the Accountant General of Bengal has been invested in 3½ per cent. Government securities; and the Council has decided to reserve the power to make use of this investment, if required by the Trustees, in awarding the prize.

Barclay Memorial Medal.

In connection with the Barclay Memorial Medal, the following gentlemen were appointed to form a special Committee to make the award during 1905—Captain L. Rogers, I.M.S., the Natural History Secretary; Mr. N. Annandale, Captain A. T. Gage, I.M.S., Mr. H. H. Hayden, and Major F. J. Drury, I.M.S.

The Society's Premises and Property.

The Council met several times to consider a letter from the Secretary to the Trustees of the Victoria Memorial, suggesting the loan of certain portraits and other objects of interest to the Victoria Memorial Hall, and, on the matter being referred to the general body of members, under rule 64A, it has been decided to lend certain specified objects for exhibition in the Victoria Memorial Hall, namely, the following portraits and other objects:—

Two portraits of the Society's founder Sir William Jones (one of him as a youth and the other in middle age) (Nos. 67 and 41);
the portrait of Warren Hastings (No. 65);
the bust of James Prinsep (No. 19);
the old cannon of Mir Jumlu (No. 2);
a Ms. of the Gulistan (No. 114);
a Ms. of the Bādshāh-nāma (No. 118);
three old copper-plate inscriptions (No. 126, found at Amgāchi; No. 135, found in the Sambalpur district; and No. 136, found at Angāsi);
a stone edict of King Aśoka (No. 25);

a portrait of Shāh Ghāzi-ud-din Haidar, King of Oudh (No. 26);
a portrait of James Grant Duff, author of the "History of the Mahrattas" (No. 51);
a painting of the interview between the Governor-General and the Raja of Kota, (No. 107); and
a portrait of Nasarat Jang, Nawab of Dacca (No. 91).

This decision was communicated to the Trustees. They asked that these objects might be placed at their disposal at once, with the exception of the Aśoka stone, for exhibition along with the other Victoria Memorial Exhibits in the galleries of the Indian Museum, and the Council have handed over the objects for exhibition in the Indian Museum Gallery during the cold season of 1904-5 with the request that the objects be returned when the exhibition closes, to be on view in the Society's rooms.

During the year certain portions of the Society's rooms were whitewashed and colourwashed; and the Council has now under consideration a proposal to execute thorough repairs and certain structural improvements in the Society's building. The cost will be great, but will be chiefly met out of a grant of Rs. 10,000 which the Government of India has generously made to the Society for the purpose. The estimates are now under consideration.

All the pictures of the Society have been cleaned and varnished at a cost of Rs. 1,306, and new frames have been received from London. The pictures will be reframed as soon as possible.

Exchange of Publications.

During 1904, the Council accepted eight applications for exchange of publications, *viz*: (1) from the Botanic Institute of Buitenzorg, Java, the Society's Journal Part II and Proceedings being exchanged for their "Annals" and "Icones Bogorienses"; (2) from the Schlesische Gesellschaft für vaterländische Cultur, Breslau, the Society's Journal Parts I—III and Proceedings being exchanged for the publications of that Society; (3) from the University of Montana, the Society's Journal Parts II and III for the "Bulletin"; (4) from the R. Accademia dei Lincei, Rome, the Society's Journal Part I–III and Proceedings being exchanged for the publications of the Academy; (5) from the Société d'Ethnographie, Paris, the Society's Journal Part III, for their "Bulletin"; (6) from the Société Royale Belge de Géographie, Brussels, the Society's Journal Part III being exchanged for their "Bulletin;" (7) from the Department of Fisheries, Sydney, the Society's Journal Part II, for their "Report"; and (8) from the Archæological Survey Department of India, the Society's Journal Parts I and III being exchanged for the publications of that Department.

In addition to these exchanges, the Imperial Library and the Lucknow Provincial Museum have been placed on the distribution list of the Society's publications.

Secretaries and Treasurer.

Dr. E. D. Ross carried on the duties of Philological Secretary till April, when Dr. T. Bloch returned from tour and took charge of the office in addition to the editorship to the *Journal Part I*, and the numismatic work which he had retained. Dr. Bloch continued till November; he left then on tour, and Dr. Ross consented to undertake both the duties, while Mr. H. N. Wright was in charge of the numismatic work.

Captain L. Rogers, I.M.S., continued Natural History Secretary and editor of the *Journal Part II*, throughout the year.

Dr. Ross continued Anthropological Secretary and editor of the *Journal Part III*, till July, when he left India on leave for three months, and Mr. J. Macfarlane took charge of his work during the interval. In December, Mr. N. Annandale was permanently appointed Anthropological Secretary in the place of Dr. Ross, who resigned.

Dr. C. R. Wilson continued to be Treasurer till April, when he left for Darjeeling. The Hon. Mr. Justice Asutosh Mukhopadhyaya consented to officiate during his absence, and when Dr. Wilson resigned his office, because of ill-health in May, he was appointed permanently to this position. During October he left Calcutta for a few weeks and Mr. W. K. Dods officiated for him.

Mr. Macfarlane continued General Secretary and editor of the *Proceedings* throughout the year, except during three months, from May to July, when he went to Europe on leave, and Lt.-Col. J. H. Tull Walsh, I.M.S., took charge of the work.

Mahamahopadhyaya Haraprasad Shastri, was in charge of the Bibliotheca Indica and the Search for Sanskrit Manuscripts, and carried on the duties of the Joint Philological Secretary throughout the year.

Mr. J. H. Elliott continued Assistant Secretary and Librarian throughout the year.

Publications.

There were published during the year ten numbers of the Proceedings (Nos. 9—11 of 1903 and Nos. 1—7 of 1904) containing 115 pages.

Of the Journal, Part I, five numbers were published (No. 2 of 1903 and Nos. 1—4 of 1904) containing 472 pages and 9 plates. The Numismatic Supplement has been published in Journal Part I, nos. 1, 2 and 4, under the editorship of Mr. Wright.

Of the Journal Part II, six numbers were published (No. 4

of 1903 and Nos. 1—5 of 1904) containing 358 pages and 9 plates. The Index for 1903 was also published.

Of the Journal Part III four numbers were published (Nos. 1—4 of 1904) containing 77 pages and 4 plates. The Index for 1903 was also published.

The other publications issued during the year were the 4th fasciculus of the Catalogue of the Society's Sanskrit Books and Manuscripts, and the 2nd fasciculus of the Catalogue of the Society's Arabic Books and Manuscripts.

Proceedings.

All important papers noticed in the Proceedings have appeared in full in the various parts of the Journal, only small papers and abstracts of the important papers being published in the Proceedings. The Rev. P. O. Bodding contributed a paper on Shoulder-headed and other forms of stone implements in the Santal Parganas. Of the implements those with square edges are supposed to be very rare in India. Mr. E. H. Walsh described certain stone implements found in the Darjeeling District, which are locally believed to be the weapons of gods and to possess various protective and medicinal powers. Mr. C. Little contributed two papers, one on the Himalayan Summer Storm of September 24th 1903, and the other on the Cyclone of 13th November 1903 in the Bay of Bengal; both have been published in the Journal with maps. Mahámahopādhyāya Haraprasad S'astri exhibited two Bengali documents obtained from Rāi Jadunāth Mozumdār Bahādur of Jessore, in which the executant purported to sell himself and his family into slavery. One was executed during the later part of the Emperor Aurangzeb's reign and the other during the great famine of 1176 B.S. Among other exhibitions one may be mentioned by Pundit Yogeśa Chandra S'āstree of two important copper-plate grants from Rajputana and Guzerat and a beautiful image of Manjunath, a Buddhist deity, brought from Lhassa. Major P. R. T. Gurdon, I.A., contributed Notes on the Khasis, Syntengs, and allied tribes inhabiting Khasia Jaintia hill district in Assam. These tribes are matriarchal; and among them the youngest daughter inherits from the mother; failing daughters, the property passes to the youngest niece; and failing a niece, to the youngest female cousin. Babu J. M. Dass in his paper "Notes on the titles used in Orissa" said that the Oria people are very fond of titles, which they accept not only from the Raja of Puri but also from great landlords and even from their castemen, while new titles are still being invented.

Journal Part I.

Five numbers were published during the year under review, namely, No. 2 of Vol. LXXII and Nos. 1-4 of Vol. LXXIII. The papers published in these numbers are of historical and linguistic value and ranged from the 6th century B.C. to the 19th century and from the Eastern extremity of Assam to the Western provinces of the Indian Empire.

Taking the papers chronologically :—Babu Parmeshwar Doyal identified the Prāgbodhi cave, where Buddha sat in meditation for some time before he came to Budh Gaya, with a stone chamber about 14 or 15 li from the Bodhi tree in the range of hills called by General Cunningham, Prāgbodhi mountain. The chamber, says the writer, had never before been visited by an antiquarian.

The late lamented Dr. C. R. Wilson identified Sandanes of the Periplus with Sundara Sātakarṇi of the Purāṇas and placed his short reign between 83 and 84 A.D.

Babu Gangamohan Laskar, a research scholar, has deciphered three copper-plates from Khurda written in what is called the Kuṭila variety of the Nāgarī character and placed the donor of the grant before the latter half of the 7th century. These plates give some information about the Śailodbhava dynasty of Kaliṅga, with seven kings. This dynasty was already known from the Baguḍa plates explained by Dr. Kielhorn.

Mr. W. N. Edwards and Mr. H. H. Mann described some interesting fortifications situated just over the boundary line of British territory in the independent Daphla country and gave the local traditions connected with them. These traditions reach back to the 13th century of the Christian era.

Babu Monmohan Chakravarti's paper on the Chronology of the Eastern Gaŋga kings of Orissa has already been referred to in the last Annual Report. It is a scholarly paper giving a collected history of these kings from the 11th century to the 15th century based upon inscriptions. The author says, "Their history (*i.e.* of the kings of the Gaŋga dynasty) now rests on surer grounds than the unreliable traditions embodied in the Mādaḷā Pāñji."

The works of the genealogists or ghaṭakas of Bengal have never been explored by Oriental scholars, yet they embody valuable information about the great races inhabiting Eastern India from the 7th century downwards. For this reason we welcome Pundit Yogeśa Chandra Śāstree's paper on the Kap section of the Varendra class of Brahmans, though short, as the beginning of an important line of research.

Coming down to Mahommedan history, Mr. Beveridge has criticised General Maclagan's paper on the Jesuit Mission to the Emperor Akbar published in our Journal for 1896, p. 38, and a portion of Dr. Wise's paper on the "Bāra Bhūyas of Eastern Bengal" published in our Journal for 1874. In the former the writer expatiated on certain chapters of the Ain-i-Akbari dealing with the position of Akbar as a founder of a religion; and in the latter the author gave much valuable additional information about Isā K͟hān, one of the twelve Bhūyas. Mr. W. Irvine's monograph on the Later Mug͟hals is continued. Mr. J. F. Fanthome's paper headed "A Forgotten City" deals with Nagarchain, the halting-station or villa of the Emperor Akbar, a few miles from Agra, which rose to be a city in the early part of his reign but was lost sight of before his death, and can with difficulty be identified at the present moment.

"The Mints of the Mughal Emperors," by Mr. Burn, gives a list of the mint towns of the Mughal Emperors arranged in alphabetical order and divided into chronological sections. Mirza Mehdy Khan criticised the translation of the Quatrains of Baba Tahir by Mr. Heron-Allen and gave an edition of these. Mr. H. R. Nevill's paper on Mahals in Sarkar Lakhnau and Maulavi Abdul Wali's paper on the Antiquity and Traditions of Shahzadpur, throw some light on obscure points of Mohammedan history.

Coming to modern History, Babu Gerindranath Dutt's history of the Hutwa Raj is an important contribution on the struggles which the English Government had in the revenue settlement of the Provinces of Lower Bengal for 30 years or more from the date of the Diwani. When writing in our Proceedings for 1888 on the Dutch hatchments in Chinsura Church, Mr. Beames left some initials undeciphered. The late Dr. C. R. Wilson studied Dutch heraldry and identified these names. His paper is to be found in vol. LXXIII, No. 3.

Of the linguistic papers the most important is that by Major P. R. T. Gurdon on the Morans, a tribe inhabiting the hills in the Assam valley. By a comparison of the words in their language with those of Kacharis, Bodos and Dimasas, Major Gurdon says that they are allied to the Kacharis. Babu Gerindranath Dutt's paper on the Bhojpuri dialects spoken in Saran is a revised edition of the notes supplied by him to the Linguistic Survey.

Of the Tibetan papers, those by Mr. E. H. Walsh have already been noticed in the last Report. The only interesting additional paper received during the year under review is by Rev. A. H. Francke entitled "A Language Map of West Tibet with notes" prepared for the benefit of the students of his Ladaki Grammar.

There has unfortunately been some irregularity in the issue of the Society's Journal, Part I, and it has now been decided to issue the Journals promptly, publishing such material as is available, and at least quarterly.

Journal Part II.

The past year has been one of great activity in the Natural History section of the Society, no less than six numbers of Part II of the Journal having been issued with 358 pages and nine illustrative plates, this quantity being more than three times as much as in the preceding year. This is due partly to the fact that some papers read during 1903 were published during the past year, and partly to the greater efforts that have been made to publish papers more rapidly than has hitherto been done; hence only two papers read recently remained in hand at the end of the year.

Botany has been specially well represented. The papers published include two important memoirs on "Materials for a Flora of the Malayan Peninsula" by Sir George King and Mr. J. S. Gamble, in which the natural orders Caprifoliaceæ and Rubiaceæ are dealt with; Nos XXI to XXIV of the Noviciæ Indicæ and three other papers describing new plants by Major D. Prain, I.M.S.; two joint papers by Major Prain and Mr. I. H. Burkill on Dioscoreæ or Yams; and one by Mr. J. R. Drummond on a new Scirpus.

The Zoological contributions include three papers on the life-history of certain insects of economic importance, by Mr. E. P. Stebbing, a paper on Additions to the Oriental Snakes at the Indian Museum by Mr. Nelson Annandale, and another by the same author (not yet published) on the Lizards of the Andamans.

Among the other contributions of interest must be mentioned a series of four papers, illustrated by plates, on "Cyclones in the Bay of Bengal" and on "Himalayan Summer Storms" by Mr. C. Little, and two by Mr. D. Hooper on the occurrence of Melanterite in Baluchistan and on Rusot, an ancient Eastern Medicine.

Adopting a proposal made by Major Prain, I.M.S., the Council resolved to hasten the publication of Sir George King's "Materials for a Flora of the Malayan Peninsula" by having it printed in London, and to issue it as an "Extra Number" of the Society's Journal, Part II.

Journal Part III.

Four numbers have been issued, three containing supplements as well as long communications. The papers are of considerable importance, for they are concise statements by men who have had opportunities of studying the less accessible Indian races or the archæology of interesting localities. Mr. J. E. Friend-Pereira contributed an Essay on the septs of the Khonds and the customs which regulate intermarriage among them; the Rev. E. M. Gordon and Major P. R. T. Gurdon have dealt, chiefly from a cultural standpoint, with primitive tribes in the Bilaspore district and in Assam respectively; the Rev. P. O. Bodding and Mr. E. H. Walsh have described stone implements from different parts of India; and various authors have furnished shorter notes and papers on other points in ethnography or sociology. The matter printed fills 77 pages and is illustrated with four photographic plates.

It has been decided that the subject of National Indian Hymns and Popular Chants might well be taken up by the members of the Society in connection with the Journal Part III.

Coins.

Ten copper coins and 13 silver coins have been presented to the Society in 1904. The copper coins belong to the following Pathān Sultans of Delhi:—

Jalāluddīn Fīroz Shāh	1
‘Aṭā’uddīn Muḥammad Shāh	1
Muḥammad ibn Tughlaq Shāh	1
Fīroz Shāh Tughlaq	6
,, with Fatḥ Khān	1

Of the 13 silver coins 4 are coins of the East India Company struck in the name of Shāh ‘Ālam at the Muḥammadābād-Benares Mint; one belongs to the kings of Oudh, and the remaining eight are coins of the following Mughal Emperors:—

Jahāngīr	1
Aurangzeb	1
Farrukhsiyar	1
Muḥammad Shāh	1
Aḥmad Shāh	2
‘Ālamgīr II.	1
Shāh ‘Ālam II.	1

In accordance with the Council order to lend to the Trustees of the Indian Museum as many of the Society's coins as may be required by them for the purpose of classification and exhibition along with the Museum coins, all the coins have been made over to the Indian Museum for selection and for return of the remainder not required by them.

In July 1904, the Council resolved to separate the Society's numismatic work from that of the Philological Secretary, and Mr. H. Nelson Wright, I.C.S., was appointed Honorary Numismatist of the Society.

Bibliotheca Indica.

In the year 1903, thirty-five fasciculi were published—a larger number than in any previous year. During 1904, however, forty-two fasciculi have been published, showing an unprecedented activity in the publication of the Bibliotheca Indica.

The cost of printing these forty-two fasciculi is Rs. 1,076 and the cost of editing Rs. 4,971; the average cost for each fasciculus being Rs. 375.

These fasciculi contain twenty-five works, of which two are in the Arabic-Persian and the rest in the Sanskrit series. According to resolution of the Council a description is to be given in the annual report only of such works as are either commenced or ended. In the case of the first, the description serves as an introduction and in the case of the last as an advertisement. The Arabic-Persian series contains translation of the Akbarnāmah and Riyāẓu-s-Salāṭīn. In the Sanskrit series too there are three English translations, namely, Mārkaṇḍeya Purāṇa, Tantra Vārtika and 'Sloka Vārtika. The last two are editions of Sanskrit works of rare value which have no chance of being published by private enterprise. Two of these belong to Jaina literature, namely, the Tattvārthādhigama Sūtra and Upamitibhava-prapañcākathā; the first was composed by Umāsvati Vācaka in the 1st Century A.D. at Pātaliputra, and the second by Siddharṣi, reputed to be the brother's son of the poet Māgha, in the beginning of the 10th century. There are two Buddhist works among these, namely, the Bodhicaryāvatāra by S'ānti Deva in the 7th century, and the S'atasāhasrika Prajñāprāmitā attributed to Nāgārjuna, the founder or at least the first great writer of the Mahājāna School, in the 2nd century A.D. Several other works are in the course of publication of which no mention is made here, since no fasciculi have been published during the year.

Of the Brāhmanic Sanskrit works two belong to the Orissa school of Smṛti, two to the Bengal, one to the Bombay, and one to the Benares school; one to the Rāmānuja School of the Vedanta, one to the Saṅkara School, and to the Mīmāṁsā School.

Of the works that have been completed, the Riyāẕ-ūs-Salāṭīn belongs to the Arabic-Persian series. It is an English translation of a history of Bengal composed by Ghulām Ḥusain Salīm between 1786 and 1789. The translation has been made by Maulavi Abdus Salām, M.A., of the Bengal Provincial Service, and he has elucidated it with ample footnotes and enriched it with an elaborate table of proper names. The Riyāẕ-ūs-Salāṭīn is the only comprehensive history of Bengal, and Stewart's History of Bengal is based upon it. Dr. Blochmann long ago strongly recommended that it should be translated, and the translation has now been accomplished.

Since H. H. Wilson translated the Viṣṇu Purāṇa, no sustained effort was made to translate any other Purāṇa till in 1884 Mr. Justice Pargiter (now our President) undertook the translation of the Mārkaṇḍeya Purāṇa. Onerous official duties and other difficulties impeded the preparation of the work with the notes. The progress was slow, but the translation has at length been brought to a close. It is accompanied by a full index and a preface in which the translator expresses the opinion that the Purāṇa had its origin in the Narbada valley, and that parts of it may be as old as, if not older than, the Christian era.

Godādhara Rājaguru, who flourished by the middle of the 18th Century, was the spiritual guide of the Gajapati Rājās of Puri. He compiled a complete code of Hindu law and ritual for Orissa. As no Hindu work from Orissa had ever been published, the publication of this work was thought desirable, and it was placed in the hands of Paṇḍit Sadā S'iva Miśra, a well-known paṇḍit of Orissa. The work consists of three volumes, of which the first has been completed with an elaborate index.

Last year was notified the completion of the Varṣakriyā Kaumudi, by Govindānanda Kavikaṅkanācārya; and the other work by the same author, belonging to the same code of Hindu law and ritual, has been completed this year, namely the S'rāddhakriyā Kaumudī, by the same young editor Paṇḍit Kamal Kṛṣṇa Smṛtibhāṣaṇa of Bhāṭpārā. He has added a full subject index of the work.

The new works undertaken during the year are :—

The Baudhāyana S'rauta Sūtra. Professor Hillebrandt of Breslau, the great authority on Vedic subjects, undertook the edition of three Vedic works for the Bibliotheca Indica, namely, Sāṅkhāyana, Baudhāyana and Hiraṇya-Keśī's S'rauta Sūtras. He completed the Sāṅkhāyana Sūtra and transferred (with the consent of the Council) the editorship of Baudhāyana's work to Dr. W. Caland of Utrecht. Dr. Caland has published two fasciculi of the work during the year under review. Baudhāyana's School is still current in Southern India, and he seems to have flourished several centuries before Christ.

The Bālambhaṭṭī or Lakṣmī is a commentary on the Mitākṣarā, by Bālambhaṭṭa Pāyaguṇḍa of Benares in the 18th century. It is an important work on the Hindu Law of the Benares school, and the Hon'ble Mr. Justice Āśutosh Mukhopādhyāya obtained the permission of the Council to edit it. But his numerous engagements afforded him little leisure, and the editorship was transferred to Babu Govinda Dās of Benares, who has published the first fasciculus during the year under review.

The Caturvarga Cintāmaṇi, by Hemādri, the Minister of the Yādava Kings of Devagiri, about the middle of the 13th century, is an encyclopedic work on Hindu Laws and rituals of great value. As it quotes from a variety of works, the publication of the entire work was considered forty years ago to be of great importance, as giving the names of Sanskrit works existing before Hemādri's time. The work is divided in parts or kaṇḍas, three of which have already been published during the last forty years. MSS. of the other parts not being procurable, the publication was kept in abeyance. During the past two years, however, the MS. of a fourth part, the Prāyaścitta-khaṇḍa, being available, the Council requested Paṇḍit Pramatha Nāth Tarkabhūṣan, Sanskrit Professor in the Sanskrit College, Calcutta, to undertake the editing of it. He has issued three fasciculi of the work this year.

The Vallāla-carita purports to be biography of Vellāla Sena, a great King of Bengal who reigned during the middle of the 12th century. It was composed from old materials by Ānanda Bhaṭṭa in the beginning of the 16th century at Navadvīpa. Several incomplete and partial reprints of the work were published in the Bengali character in Calcutta, but no authentic MS. was forthcoming. During the caste agitation that arose after the census of 1901, two authentic MSS. of the work, were placed in the hands of Mahāmahopādhyāya Haraprasād Sāstri, and the Council requested him to publish the work in Deva Nāgarī with an English translation and historical notes. The first fasciculus has been published containing the text only. The translation and notes are in the course of preparation.

Search for Sanskrit MSS.

This department of the Society's work was, as in previous years, in the hands of the Joint Philological Secretary. He paid several visits to Benares and other places, and with the assistance of his travelling paṇḍits collected more than 1,200 MSS. and about 300 notices of MSS. So much material has been collected that it is now possible to give a connected history of Hindu literature during the whole of the Mohammadan period and to check in many important instances the statements of Mohammadan historians about the Hindus. A complete list of the names of the MSS. in the entire Government collection, now amounting to nearly 7,000 MSS., has been prepared in alphabetical order for publication. The second volume of the second series of notices of Sanskrit MSS. has been published. The third volume has been printed, and the Nepal Catalogue is in type; and both will shortly be published. The fourth and fifth volume are ready in manuscript and will soon be sent to press.

The President was empowered to apply to the Government of India for a special grant for the purchase of about 2,000 Jaina works in Sanskrit, Prakrit, Guzerati, Hindi, Marwari and other languages on behalf of the Government, if, on further examination of the manuscripts, he is assured that the collection is valuable enough to warrant such an application. The application has been made.

The notices of Hindi manuscripts collected by the Society's agents during the year 1895 have been made over to the Nāgarīprachārini Sabhā of Benares for publication at the Society's cost.

Search for Arabic and Persian Manuscripts.

In answer to the representation made by the Society to the Government of India, in favour of a systematic search for Arabic and Persian MSS., the Government approved of the scheme and sanctioned an annual grant of Rs. 5,000 for a period of five years for its prosecution, and a further annual grant of Rs. 2,000 for the same period, for the purchase of manuscripts of exceptional value and interest. The search is in charge of Dr. Ross, and he has appointed two Travelling Maulavis and a Resident Maulavi to assist him in this work.

The Report having been read and some copies having been distributed, The Hon'ble Mr. Pargiter, President, gave his Annual Address.

Annual Address, 1904.

The Secretaries have laid before you their combined report setting out briefly the business that has been transacted by the

Society or that has come before it during the past year, and it remains for me to offer some remarks on its affairs during the same period.

The matter that engrossed the largest share of time has been the preparation of the new catalogue of the books in the Society's Library. The catalogue now in use was published twenty years ago, when the Society celebrated its centenary, and the need of a revised one has been felt for some years past. A new catalogue has been gradually compiled in manuscript, and there remained the arduous business of making a thorough revision of it. This has been carried through by the Library Committee with the help of the General Secretary, who, as a skilled librarian, was specially qualified to deal with it. The members of the Committee have given liberally of their time and have held many meetings to complete the revision; and but for the care, and I may say devotion, which they and the Secretary have bestowed on it, it could not have been carried through with any expectation that the catalogue would be full, accurate and useful. In this matter two tasks called for special consideration—first, the revision of the Library itself and the separating out of books and pamphlets that are not needed by the Society; and secondly, the framing of the entries in the most serviceable shape.

A considerable quantity of publications had accumulated which appeared to be either superfluous or of too little use to the members, and it was desirable to remove them because of the limited space and for economy. These were separated as the revision went on. The principles adopted were two, first, that the Library should aim at completeness in all publications relating to Asia in conformity with the Society's name and scope, whatever might be their character or value, official reports and publications being placed in a separate category; and secondly, that the Library could not maintain works relating to other parts of the world except such as are of general interest and high reputation. Yet the process of exclusion was applied with so conservative a spirit that nothing was put out unless the members of the Committee were unanimous. A list of the works thus excluded was laid before the monthly meeting in June for general consideration, and has been passed without objection. These will be disposed of as mentioned in the Report.

The second task dealt with the method of cataloguing the names of Oriental authors, and the Committee decided that no single method was feasible, and that the most convenient course was that, while the names of authors now living or recently deceased should be spelt as the authors themselves Anglicized them, the names of all others should be transliterated correctly in the headings according to the system approved by the Society.

The catalogue is now in the press, and the Council trust that it will be as complete, accurate and useful as is possible in such an undertaking. When it is published, members will be able to keep their copies correct up to date, since lists of the additions are published quarterly with the Proceedings.

Another important matter was the part which the Society was able to take in contributing to the objects to be exhibited in the Victoria Memorial Hall. The Society's existence is nearly coeval with British rule in Bengal, and it has represented the linguistic, scientific and literary activity of this rule. It has numbered among its members, besides its founder, some of the most distinguished men whose services have helped to make India what it is now, and it possesses unique memorials of them. The members resolved, with but little difference of opinion, to lend some of the most interesting of their treasures to the Trustees of the Memorial Hall to be exhibited there. The Society is gratified at this public recognition of its achievements, and cannot but gain by the wider interest which the exhibition of these objects will arouse among those who will visit the Memorial.

The collection of Oriental MSS. is an important branch of the Society's work. The Society has received during many years an annual grant from the Government for the systematic search after and the purchase of Sanskrit MSS. This is in the charge of the Joint Philological Secretary, Mahāmahopādhyāya Haraprasād Sāstrī. He has found and acquired a large number of valuable and interesting writings. No similar measures have hitherto been taken to collect Persian and Arabic MSS. from among the stores that exist in this country, except such as private persons have undertaken at times on their own behalf; but during the past year the Government of India has generously assigned a further annual grant in order that a systematic search may be made for those classes of writings, and that valuable MSS. may be bought and preserved here in the same way as Sanskrit MSS. This business has been placed in the hands of the present Philological Secretary, Dr. Ross, and he has been prosecuting an active search with the aid of maulavis during the last five months. He has discovered a number of private libraries that were not known to us before; the works in them have been examined, and what has been already found offers sanguine expectations that the grant will enrich our collection with writings of the highest interest and value, especially for historical purposes. I may add that the recent expedition to Thibet has brought to light a quantity of Thibetan MSS.; these have been placed temporarily in the Imperial Library here and are available for study.

The Society has about 600 Jain manuscripts in its custody at present. These are not always easy to be obtained, because the Jains do not part with their writings readily. Mahāmahopādhyāya Haraprasād Sāstrī has however recently learnt of a valuable collection of such manuscripts, comprising nearly two thousand works or portions of works, and the owner, who is not a Jain, is willing to sell them. It is very desirable that they should be secured. An application has been made to the Government of India for special aid towards their purchase, and if they can be bought, the total collection of Jain manuscripts which will be in the Society's custody will be the finest in the world.

These collections demand that the fullest use should be made of them, and one of the first duties will be to compile descriptive catalogues of the Persian, Arabic and Jain manuscripts, as has been done for the Sanskrit manuscripts. In all this fresh work we must look more to our Indian members to prosecute the research necessary. Some use is made of these manuscripts by scholars in Europe, and by European scholars resident in this country; but the number of the latter is very small and will probably be fewer in the future. Members of the Government Services can only give of the leisure, which they can spare from their official duties, towards qualifying themselves in Oriental learning and studying Oriental works; and they are less able year by year to find leisure for such studies. Their official duties increase and become more exacting, and do not in any way conduce towards acquiring any thorough acquaintance with ancient learning. The two pursuits have been continually diverging more and more markedly. Moreover, to add to the hesitation that besets Oriental study here, the standard of Oriental attainments required rises with the additional knowledge that is continually accumulated by scholars in Europe. These and other reasons deter members of those Services from attempting original research in these fields, and there are very few, if any, inducements. The opportunities therefore are all the ampler for Indian students, and a career of distinction is open to them, if they will carry on their investigations according to the standard of European scholarship. This is, no doubt, not a simple qualification, yet it is essential; and those of them are fortunate who can receive some part of their training from European teachers. It is very much to be wished that more training of this kind should be available for them.

The scientific side of the Society's work, on the other hand, should increase in the future. The Scientific Departments of the Government have been strengthened. Among the members of those services there is no such disagreement between official duties and private pursuits; but the two blend and strengthen each other, and scientific research and professional success go hand in hand. For scientific investigation, therefore, there are the most encouraging inducements. Moreover, as private enterprise develops the resources of the country, Science will be applied to those objects in larger measure, and the number of workers in scientific fields should steadily increase. The Society must hope that it will receive the benefit of all such investigations in future, and that more scientific papers will be contributed to its Journal rather than communicated to the publications of the various Societies in England.

A matter that concerns us closely is the style in which our Proceedings and Journal are published. This is now under consideration. The present style is what was adopted many years ago, and the Council desire to improve and probably enlarge these publications and add more illustrations, so as to suit the requirements of the present day better. Efforts are also being made to issue our publications promptly, and the Council hope that members will contribute papers the more readily in that the Journal will then supply them with a greater quantity of matter of varied interest. These modifications should tend to increase the sale of our publications in Europe; and the Report mentions the change which has been made in the Society's agency in London to secure a readier, larger and more remunerative disposal. Our thanks are due to Mr. Macfarlane who arranged the new terms during his visit home on leave last year.

Steady progress has been made in the publication of the Bibliotheca Indica. Mr. Beveridge has finished his translation of the Akbarnāma; fresh work will be placed in his hands, and it is hoped arrangements may be made for additional works on the Persian and Arabic side, which has of late years rather given way to the Sanskrit side. This should be one of the first results of the systematic search that (as I have mentioned) is being made for Persian and Arabic manuscripts. Among Sanskrit writings the Society should, I think, pay more attention to various old works in future, which represent rather the general or popular side of literature. Archæological discoveries in ancient countries have shewn that the accounts handed down from ancient times are not as fictitious as was imagined formerly, but contain much substantial truth. This should be found true in India also. With regard to the Purāṇas, for instance, recent researches have indicated that they are more ancient than was conjectured a generation ago. Professor Wilson estimated their age as lying between the eighth and thirteenth centuries approximately, but it now seems that all of them were composed earlier, most of them before the seventh century, and some at least in the earliest centuries of the Christian era. Similarly the Tantras appear to be more ancient than was imagined, and a study of them will throw much needed light on a very wide and obscure though important subject, namely, on various phases of the popular forms of Hindu religion of modern times and of the present day. The Society might well turn part of its attention to these and other original compositions rather than towards editing commentaries, which are admittedly of comparatively modern origin.

Much attention has been given to the Society's house, and various repairs and improvements have been carried out. Through the generosity of the Government of India the munificent sum of Rs. 10,000 was granted for the further improvement of this building. Proposals and estimates have been drawn up and are now under consideration, and when the Council has decided how the funds at its disposal can be best utilized, the alterations will be undertaken and should be finished this year.

The valuable pictures which the Society possesses, either as its own or as Trustee of the Home Bequest, required renovation. They have been cleaned, re-stretched and varnished. Fresh frames were selected by the late President, the Hon. Mr. Bolton, in London, and have recently arrived. The pictures are now being placed in their new frames and will be re-hung, when the repairs to the building are completed, and re-arranged so as to show to better advantage. The expense has been great, but the renovation should suffice for many years.

The Report shows that the list of the Society's members has increased so as to stand now at a higher number than it has ever recorded in the past. This is of good augury for the future, and we trust that among the new members many will contribute not only their interest in the Society's business, but also the results of travels and inquiries. The inquiries that were open to members in the Society's early days were many and wide, and offered all the attraction and interest that newly-discovered fields possess, where all information is welcome; but the conditions of research have greatly altered now. In the settled Provinces of India, no doubt, the harvest of investigation has been freely reaped, and what more is to be gathered becomes rather the work of specialists and experts. The field of Indian investigation has been surveyed and described, and the work that remains is for those who can bring minds, unburdened with other demands and replete with knowledge, to the elucidation of the problems and difficulties that have arisen out of the general survey. Yet much valuable ethnological information still awaits the gathering among the ruder tribes, especially in the outlying Provinces. To members who have such opportunities the ethnological side of the Society's researches offers ample scope for investigation, and if they will make careful and systematic notes about those tribes and their languages, customs and religion, they can supply facts of real interest and value, as regards both the early conditions of such tribes and also the changes that are being worked among them by the influence of Hinduism.

I will conclude by mentioning some matters of interest which lie outside the Society, but in which members have taken or are taking a part.

A Buddhist Sanskrit Appendix was compiled to Rai Sarat Chandra Das' Thibetan Dictionary under the auspices of the Government, and the Government has recently placed it in the capable hands of M. de La Vallée Poussin in Belgium, in order that it may receive a finishing revision from a European scholar.

The Archæological Department of Government has published its first annual volume. It covers the whole ground of such research and sets out most interesting discoveries with a wealth of detailed information.

A book of great interest has lately been published by Mr. Vincent Smith on the early history of India from B.C. 600 to the Mohammedan conquest. It brings the latest discoveries to elucidate that long and most important period, and will be of signal service to students in this country. Prof. Thibaut has published in the series of Sacred Books of the East a translation of Rāmānuja's great work, the S'ribhāṣya, which is a commentary on the Vedānta Sūtras and is the standard book of the Vaiṣṇavas of South India. Dr. Grierson has published two more parts of his monumental work in the Linguistic Survey of India.

A Flora of the Panjab is now under compilation, and the duty has been entrusted by the Government to Mr. Drummond of the Civil Service.

The Imperial Academy of Sciences of Vienna wished to obtain a record of Sanskrit recitation and music for the study of ancient texts, and Dr. Exner, who is now in India, succeeded in obtaining the best results that are possible in Calcutta with the aid of a phonograph, as selected passages were recited by the best qualified paṇḍits.

The Bombay Branch of the Royal Asiatic Society has just celebrated its centenary, and the Council arranged that three of our members should attend and offer it our congratulations.

The President announced that the Scrutineers reported the result of the election of Officers and Members of Council to be as follows :—

President.

His Honor Sir A. H. L. Fraser, M.A., LL.D., K.C.S.I.

Vice-Presidents.

The Hon. Mr. Justice Asutosh Mukhopadhyaya, M.A., D.L., F.R.A.S., F.R.S.E.
T. H. Holland, Esq., F.G.S., F.R.S.
C. W. McMinn, Esq., I.C.S. (retired).

Secretary and Treasurer.

Honorary General Secretary :—J. Macfarlane, Esq.
Treasurer :—The Hon. Mr. Justice Asutosh Mukhopadhyaya, M.A., D.L., F.R.A.S., F.R.S.E.

Additional Secretaries.

Philological Secretary :—E. D. Ross, Esq., Ph.D.
Natural History Secretary :—Capt. L. Rogers, M.D., B.Sc., I.M.S.
Anthropological Secretary :—N. Annandale, Esq., B.A.
Joint Philological Secretary :—Mahamahopadhyaya Haraprasad Shastri, M.A.

Other Members of Council.

The Hon. Mr. Justice F. E. Pargiter, B.A., I.C.S.
Kumar Ramessur Maliah.
I. H. Burkill, Esq., M.A.
H. E. Kempthorne, Esq.
W. D. Dods, Esq.
The Hon. Mr. A. Earle, I.C.S.
Lt.-Col. J. H. Tull Walsh, I.M.S.
R. O. Lees, Esq.
H. H. Hayden, Esq., B.A., F.G.S.
E. Thornton, Esq., F.R.I.B.A.

The Meeting was then resolved into the Ordinary General Meeting.

HIS EXCELLENCY LORD CURZON, G.M.S.I., G.M.I.E., Patron, in the chair.

The minutes of the last meeting were read and confirmed.

Thirty-six presentations were announced.

Mr. J. De Grey Downing and Captain G. W. Megaw, I.M.S., were ballotted for and elected Ordinary Members.

It was announced that Mr. B. C. Sen and Rai Lakshisankar Misra Bahadur had expressed a wish to withdraw from the Society.

The President announced that Mr. P. R. Bramley, Babu Gopal Chandra Chatterjee and Mr. Mahammad Rafiq elected members of the Society on 3rd February, 1st June and 6th July 1904, respectively, not having paid their entrance fees, their election have become null and void under Rule 9, and that the election of Rev. S. Endle has been cancelled at his own request.

The General Secretary exhibited two photographs of the stone image of Buddha forwarded by the Commissioner of the Chittagong Division, and read the following note on it prepared by Pandit Satis Chandra Vidyabhusana :—

This image represents Buddha sitting on *Padmāsana* or lotus-seat which is defined as a particular posture in religious meditation in which the devotee sits with the thighs crossed, with one hand resting on the left thigh, the other held up with the thumb bent towards the heart, and the eyes directed towards the tip of the nose.

The image, which is a specimen of neither the Indo-Greek, Indo-Scythian or Dravidian sculpture, is the representation of an Arakanese Buddha which differs a little from the Buddhas of Burma proper. The image must have been prepared about the year 1560 A.D., when Chittagong was completely conquered by the Arakanese and was made a province of Arakan. Chittagong remained a province of Arakan up to 1666 A.D., when it was snatched away by the Mahomedans. The town was stormed and the Arakanese settlers driven out of Chittagong. After the annexation of Arakan by the King of Burma, a large number of fresh Arakanese Buddhists immigrated into Chittagong at the close of the 18th Century A.D. The Maghs that now live in Chittagong are the descendants of these last immigrants. They know nothing of this image and there is no local tradition about it. It was in fact prepared before their arrival in Chittagong, and before the storming of the city by the Mahomedans.

According to the Burmese legends, in the reign of King Thirimegha in the middle of the 14th Century A.D., a canine tooth of Buddha was brought to Tsitkain. If Tsitkain is identified with Chittagong (about which there is of course a grave doubt), then in some future time we may expect also to find in Chittagong the golden casket in which the precious tooth-relic was placed.

Pandit Satis Chandra Vidyabhusana exhibited images of five of the sixteen famous Buddhist Mahasthaviras recovered from Tibet.

LIST OF MEMBERS

OF THE

ASIATIC SOCIETY OF BENGAL.

ON THE 31ST DECEMBER, 1904.

LIST OF OFFICERS AND MEMBERS OF COUNCIL OF THE ASIATIC SOCIETY OF BENGAL FOR THE YEAR 1904.

President :

The Hon'ble Mr. Justice F. E. Pargiter, B.A., I.C.S.

Vice-Presidents :

The Hon'ble Mr. Justice Asutosh Mukhopadhyaya, M.A., D.L., F.R.S.E.
Lieut.-Col. D. Prain, M.A., M.B., LL.D.
T. H. Holland, Esq., F.G.S., F.R.S.

Secretary and Treasurer.

Honorary General Secretary : J. Macfarlane, Esq.
The Hon'ble Mr. Justice Asutosh Mukhopadhyaya, M.A., D.L., F.R.S.E.

Additional Secretaries.

Philological Secretary : T. Bloch, Esq., Ph.D.
Natural History Secretary : Captain L. Rogers, M.D., B.Sc., I.M.S.
Anthropological Secretary : E. D. Ross, Esq., Ph.D.
Joint Philological Secretary : Mahāmāhopādhyāya Haraprasād Shastri, M.A.

Other Members of Council.

T. H. D. La Touche, Esq., B.A.
Kumar Ramessur Maliah.
Arnold Caddy, Esq., M.D., F.R.C.S.
I. H. Burkill, Esq., M.A.
H. E. Kempthorne, Esq.
C. Little, Esq., M.A.
W. K. Dods, Esq.
The Hon'ble Mr. A. Earle, I.C.S.
Lieut.-Col. J. H. Tull Walsh, I.M.S.
R. O. Lees, Esq.

LIST OF ORDINARY MEMBERS.

R. = Resident. N.R. = Non-Resident. A. = Absent. N.S. = Non-Subscribing.
L.M. = Life Member. F.M. = Foreign Member.

N.B.—Members who have changed their residence since the list was drawn up are requested to give intimation of such a change to the Honorary General Secretary, in order that the necessary alteration may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the Honorary General Secretary.

Members who are about to leave India and do not intend to return are particularly requested to notify to the Honorary General Secretary whether it is their desire to continue Members of the Society; otherwise, in accordance with Rule 40 of the rules, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.		
1903 Feb. 4.	R.	Abdul Alim. *Calcutta.*
1894 Sept. 27.	N.R.	Abdul Wali, Maulavie. *Ranchi.*
1895 May 1.	R.	Abdus Salam, Maulavie, M.A. *Calcutta.*
1903 April 1.	N.R.	Abul Aâs, Maulavie Sayid, Rais and Zemindar. *Patna.*
1901 Aug. 7.	A.	Adams, Margaret. Baptist Zenana Mission. *Europe.*
1904 Sept. 28.	N.R.	Ahmad Hasain Khan, Munshi. *Jhelum.*
1888 April 4.	R.	Ahmud, Shams-ul-ulama Maulavie, Arabic Professor, Presidency College. *Calcutta.*
1888 Feb. 1.	R.	Alcock, Major Alfred William, M.B., LL.D., C.I.E., F.R.S. *Calcutta.*
1885 Mar. 4.	L.M.	Ali Bilgrami, Sayid, B.A., A.R.S.M., F.G.S. *Hyderabad.*
1899 Jan. 4.	N.R.	Ali Hussain Khan, Nawab. *Bhopal.*
1903 Oct. 28.	R.	Allan, Dr. A. S., M.B. *Calcutta.*
1900 Aug. 1.	A.	Allen, C. G. H., I.C.S. *Europe.*
1874 June 3.	A.	Ameer Ali, M.A., C.I.E., Barrister-at-Law, *Europe.*
1893 Aug. 31.	A.	Anderson, Major A. R. S., B.A., M.B., I.M.S. *Europe.*
1884 Sept. 3.	A.	Anderson, J. A. *Europe.*
1904 Sept. 28.	R.	Annandale, Nelson, B.A. *Calcutta.*
1904 Jan. 6.	R.	Ashton, R. P. *Calcutta.*
1904 July 6.	N.R.	Aulad Hasan, Sayid. *Dacca.*
1870 Feb. 2.	L.M.	Baden-Powell, Baden Henry, M.A., C.I.E. *Europe.*

Date of Election.		
1901 Jan. 2.	A.	Badshah, K. J., B.A., I.C.S. *Europe.*
1898 Nov. 2.	A.	Bailey, The Revd. Thomas Grahame, M.A., B.D., *Europe.*
1891 Mar. 4.	N.R.	Baillie, D. C., I.C.S. *Ghazipur.*
1898 Aug. 3.	N.R.	Bain, Lieut.-Col. D. S. E., I.M.S. *Mercara.*
1891 April 1.	N.R.	Baker, Edward Charles Stuart. *Dibrugarh.*
1900 Aug. 29.	R.	Baker, The Hon. Mr. E. N., C.S.I., I.C.S. *Calcutta.*
1896 Mar. 4.	N.R.	Banerji, Satish Chandra, M.A. *Allahabad.*
1869 Dec. 1.	L.M.	Barker, R. A., M.D. *Europe.*
1885 Nov. 4.	R.	Barman, Damudar Das. *Calcutta.*
1877 Jan. 17.	N.R.	Barman, H.H. The Maharaja Radha Kishor Dev. *Tipperah.*
1898 Mar. 2.	N.R.	Barnes, Herbert Charles, I.C.S. *Shillong.*
1902 May 7.	R.	Bartlett, E. W. J. *Calcutta.*
1894 Sept. 27.	R.	Basu, Nagendra Natha. *Calcutta.*
1898 May 4.	R.	Bathgate, J. *Calcutta.*
1895 July 3.	L.M.	Beatson-Bell, Nicholas Dodd, B.A., I.C.S. *Europe.*
1876 Nov. 15.	F.M.	Beveridge, Henry, I.C.S. (retired). *Europe.*
1900 April 4.	N.R.	Bingley, Major A. H., I.A. *Simla.*
1898 Nov. 2.	A.	Black, Robert Greenhill. *Europe.*
1859 Aug. 3.	L.M.	Blanford, William Thomas, LL.D., A.R.S.M., F.G.S., F.R.G.S., F.Z.S., F.R.S. *Europe.*
1897 Feb. 3.	R.	Bloch, Theodor, PH.D. *Calcutta.*
1893 Feb. 1.	N.R.	Bodding, The Revd. P. O. *Rampore Haut.*
1885 Mar. 4.	A.	Bolton, The Hon. Mr. Charles Walter, C.S.I., I.C.S. *Europe.*
1895 July 3.	N.R.	Bonham-Carter, Norman, I.C.S. *Saran.*
1890 July 2.	A.	Bonnerjee, Womes Chunder, Barrister-at-Law, Middle Temple. *Europe.*
1897 June 2.	N.R.	Bose, Annada Prasad, M.A. *Jalpaiguri.*
1895 Mar. 6.	R.	Bose, Jagadis Chandra, M.A., D.SC., C.I.E., Bengal Education Service. *Calcutta.*
1880 Nov. 3.	R.	Bose, Pramatha Nath, B.SC., F.G.S. *Calcutta.*
1895 April 3.	N.R.	Bourdillon, The Hon. Sir James Austin, K.C.I.E., C.S.I., I.C.S. *Mysore.*
1860 Mar. 7.	L.M.	Brandis, Sir Dietrich, K.C.I.E., PH.D., F.L.S., F.R.S. *Europe.*
1900 Aug. 1.	R.	Brown, Major E. Harold, M.D., I.M.S. *Calcutta.*
1901 Sept. 25.	R.	Buchanan, Major W. J., I.M.S. *Calcutta.*
1887 May 4.	R.	Bural, Nobin Chand, Solicitor. *Calcutta.*
1901 June 5.	R.	Burkill, I. H., M.A. *Calcutta.*
1896 Jan. 8.	N.R.	Burn, Richard, I.C.S. *Allahabad.*
1900 May 2.	N.R.	Butcher, Flora, M.D. *Palwal.*
1904 Aug. 3.	R.	Bythell, Major, W. J., R.E. *Calcutta.*
1898 Sept. 30.	R.	Cable, Ernest. *Calcutta.*
1896 Jan. 8.	R.	Caddy, Dr. Arnold. *Calcutta.*
1901 Jan. 2.	A.	Campbell, Duncan. *Europe.*

Date of Election.		
1901 Mar. 6.	N.R.	Campbell, W. E. M., I.C.S. *Naini Tal.*
1895 July 3.	R.	Carlyle, The Hon. Mr. Robert Warrand, C.I.E., I.C.S. *Calcutta.*
1890 June 4.	R.	Chakravarti, Man Mohan, M.A., B.L. Deputy Magistrate. *Chinsurah.*
1901 June 5.	A.	Chapman, E. P., I.C.S. *Europe.*
1904 July 6.	N.R.	Charles, A. P., I.C.S. *Agra.*
1902 Aug. 27.	R.	Chaudhuri, A., Barrister-at-Law. *Calcutta.*
1893 Sept. 28.	R.	Chaudhuri, Banawari Lala, B.SC., Edin. *Calcutta.*
1902 April 2.	R.	Chunder, Raj Chunder, Attorney-at-Law. *Calcutta.*
1880 Aug. 26.	F.M.	Clerk, General Malcolm G. *Europe.*
1903 Aug. 26.	R.	Copleston, The Right Revd. Dr. Reginald Stephen, D.D. *Lord Bishop of Calcutta.*
1898 June 1.	F.M.	Cordier, Dr. Palmyr. *Europe.*
1876 Mar. 1.	F.M.	Crawford, James, B.A., I.C.S. *Europe.*
1901 June 5.	R.	Crawford, Major D. G., I.M.S. *Chinsurah.*
1887 Aug. 25.	R.	Criper, William Risdon, F.C.S., F.I.C., A.R.S.M. *Calcutta.*
1895 July 3.	N.R.	Cumming, John Ghest, I.C.S. *Patna.*
1873 Dec. 3.	F.M.	Dames, Mansel Longworth, I.C.S. *Europe.*
1901 Aug. 28.	N.R.	Das, Govinda. *Benares.*
1903 Feb. 4.	N.R.	Das, Rai Bahadur Bhawan, M.A. *Hoshiarpur.*
1865 June 7.	N.R.	Das, Raja Jay Krishna, Bahadur, C.S.I. *Moradabad.*
1879 April 7.	N.R.	Das, Ram Saran, M.A., Secy., Oudh Commercial Bank, Limited. *Fyzabad, Oudh.*
1900 July 4.	N.R.	Das, Syam Sunder, B.A. *Benares.*
1896 Mar. 4.	R.	Das-Gupta, Jogendra Nath, B.A., Barrister-at-Law *Calcutta.*
1904 July 6.	N.R.	De, Brajendra Nath, M.A., I.C.S. *Malda.*
1904 Sept. 28.	N.R.	DeCourcy, W. B. *Cachar.*
1903 June 3.	N.R.	De, Hari Nath, B.A. (Cantab). *Dacca.*
1895 Sept. 19.	N.R.	De, Kiran Chandra, B.A., I.C.S. *Faridpur.*
1902 Mar. 5.	R.	Deb, Raja Binoy Krishna, Bahadur. *Calcutta.*
1895 Dec. 4.	N.R.	Delmerick, Charles Swift. *Bareilly.*
1899 Aug. 30.	N.R.	Dev, Raj Kumar Satchidanand, Bahadur. *Deogarh, Sambalpur.*
1900 May 2.	N.R.	Dev, Raja Satindra, Rai Mahesaya. *Bansberia.*
1901 June 5.	N.R.	Dey, Nundolal. *Bankipore.*
1902 Feb. 5.	N.R.	Dixon, F. P. I.C.S. *Chittagong.*
1898 Jan. 5.	R.	Dods, W. K. *Calcutta.*
1902 July 2.	R.	Doxey, F. *Calcutta.*
1886 June 2.	R.	Doyle, Patrick, C.E., F.R.A.S., F.R.S.E., F.G.S. *Calcutta.*
1902 Jan. 8.	R.	Drummond, J. R., I.C.S. *Calcutta.*
1892 Sept. 22.	R.	Drury, Major Francis James, M.B., I.M.S. *Calcutta.*

Date of Election.		
1889 Jan. 2.	N.R.	Dudgeon, Gerald Cecil, Holta Tea Co., Ld. *Palampur.*
1879 Feb. 5.	F.M.	Duthie, J. F., B.A., F.L.S. *Europe.*
1892 Jan. 6.	N.R.	Dutt, Gerindra Nath. *Hutwa.*
1877 Aug. 30.	R.	Dutt, Kedar Nath. *Calcutta.*
1900 April 4.	A.	Dyson, Major Herbert Jekyl, F.R.C.S., I.M.S. *Europe.*
1900 July 4.	R.	Earle, The Hon. Mr. A., I.C.S. *Calcutta.*
1901 June 5.	N.R.	Ede, Francis Joseph, C.E., A.M.I.C.E., F.G.S. *Silchar, Cachar.*
1903 Oct. 28.	R.	Edelston, T. D. *Calcutta.*
1903 May 6.	N.R.	Edwards, Walter Noel. *Sootea, Assam.*
1900 Mar. 7.	R.	Fanshawe, Sir Arthur Upton, C.S.I., K.C.I.E., I.C.S. *Calcutta.*
1900 Aug. 29.	A.	Fanshawe, The Hon. Mr. H. C., C.S.I., I.C.S. *Europe.*
1901 Mar. 6.	A.	Fergusson, J. C. *Europe.*
1904 Aug. 3.	R.	Fermor, L. Leigh. *Calcutta.*
1894 Dec. 5.	A.	Finn, Frank, B.A., F.Z.S. *Europe.*
1898 Sept. 30.	R.	Firminger, The Revd. Walter K., M.A. *Calcutta.*
1902 April 2.	N.R.	Fuller, The Hon'ble Mr. J. B., I.C.S. *Shillong.*
1903 Mar. 4.	R.	Gage, Captain Andrew Thomas, M.A., M.B., B.SC., F.L.S., I.M.S. *Sibpur.*
1893 Jan. 11.	A.	Gait, Edward Albert, I.C.S. *Europe.*
1899 Aug. 30.	R.	Garth, Dr. H. C. *Calcutta.*
1902 June 4.	N.R.	Ghaznavi, A. A. *Mymensing.*
1889 Jan. 2.	R.	Ghose, Jogendra Chandra, M.A., B.L. *Calcutta.*
1902 Feb. 5.	R.	Ghosh, Girish Chunder, *Calcutta.*
1889 Mar. 6.	R.	Ghosha, Bhupendra Sri, B.A., B.L. *Calcutta.*
1869 Feb. 3.	N.R.	Ghosha, Pratapa Chandra, B.A. *Vindyachal.*
1897 Dec. 6.	A.	Godfrey, Captain Stuart, I.A. *Europe.*
1861 Feb. 5.	N.S.	Godwin-Austen, Lieut.-Colonel H. H., F.R.S., F.Z.S., F.R.G.S. *Europe.*
1897 July 7.	A.	Grant, Captain J. W., I.M.S. *Europe.*
1876 Nov. 15.	A.	Grierson, George Abraham, PH.D., C.I.E., I.C.S. *Europe.*
1900 Dec. 5.	L.M.	Grieve, J. W. A. *Kalimpong.*
1901 April 3.	N.R.	Guha, Abhaya Sankara. *Goalpara.*
1898 June 1.	N.R.	Gupta, Bepin Behari. *Cuttack.*
1898 April 6.	R.	Gupta, Krishna Govinda, I.C.S., Barrister-at-Law. *Calcutta.*
1898 Jan. 5.	N.R.	Gurdon, Major P. R. T., I.A. *Gauhati.*
1901 Mar. 6.	N.R.	Habibur Rahman Khan, Maulavie. *Bhikampur.*
1892 Jan. 6.	N.R.	Haig, Major Wolseley, I.A. *Berar.*

Date of Election.		
1904 Sept. 28.	R.	Hallward, N. L. *Calcutta.*
1899 April 5.	A.	Hare, Major E. C., I.M.S. *Europe.*
1884 Mar. 5.	L.M.	Hassan Ali Qadr, Sir Sayid, Nawab Bahadur, K.C.I.E. *Murshedabad.*
1897 Feb. 3.	R.	Hayden, H. H., B.A., B.E., F.G.S., Geological Survey of India. *Calcutta.*
1904 June 1.	F.M.	Hewett, J. F., I.C.S. (retired). *Europe.*
1904 Dec. 7.	N.R.	Hill, E. G. *Allahabad.*
1892 Aug. 3.	A.	Hill, Samuel Charles, B.A., B.SC. *Europe.*
1872 Dec. 5.	A.	Hoernle, Augustus Frederick Rudolf, PH.D., C.I.E. *Europe.*
1891 July 1.	R.	Holland, Thomas Henry, A.R.C.S., F.G.S., F.R.S., Director, Geological Survey of India. *Calcutta.*
1898 Feb. 2.	R.	Hooper, David, F.C.S. *Calcutta.*
1884 Mar. 5.	N.R.	Hooper, The Hon. Mr. John, B.A., I.C.S. *Allahabad.*
1901 Dec. 4.	R.	Hossack, Dr. W. C. *Calcutta.*
1873 Jan. 2.	L.M.	Houstoun, G. L., F.G.S., *Europe.*
1890 Dec. 3.	N.R.	Hyde, The Revd. Henry Barry, M.A. *Madras.*
1866 Mar. 7.	F.M.	Irvine, William, I.C.S. (retired). *Europe.*
1903 Sept. 23.	N.R.	Ito, Professor C. *Bombay.*
1904 Jan. 6.	R.	Jackson, V. H., M.A. *Sibpur.*
1899 April 5.	R.	Kempthorne, H. E. *Calcutta.*
1882 Mar. 1.	N.R.	Kennedy, Pringle, M.A. *Mozufferpore.*
1867 Dec. 4.	A.	King, Sir George, M.B., K.C.I.E., LL.D., F.L.S., F.R.S., I.M.S. (retired). *Europe.*
1904 May 4.	N.R.	Knox, K. N., I.C.S. *Banda.*
1896 Aug. 27.	A.	Konstam, Edwin Max. *Europe.*
1896 July 1.	R.	Küchler, George William, M.A., Bengal Education Service. *Calcutta.*
1891 Feb. 4.	N.R.	Kupper, Raja Lala Bunbehari. *Burdwan.*
1899 Aug. 30.	N.R.	Lal, Dr. Mannu. *Banda.*
1902 Feb. 5.	N.R.	Lal, Lala Shyam. *Allahabad.*
1904 Jan. 6.	N.R.	Lal, Panna, M.A., B.SC. *Damoh.*
1902 Jan. 8.	A.	Lall, Parmeshwara. *Europe.*
1887 May 4.	L.M.	Lanman, Charles R. *Europe.*
1889 Mar. 6.	R.	La Touche, Thomas Henry Digges, B.A., Geological Survey of India. *Calcutta.*
1900 Sep. 19.	R.	Law, The Hon. Sir Edward F. G., K.C.M.G., C.S.I. *Calcutta.*
1902 July 2.	N.R.	Leake, H. M. *Saharanpur.*
1889 Nov. 6.	A.	Lee, W. A., F.R.M.S. *Europe.*
1904 July 6.	R.	Lees, R. O. *Calcutta.*
1903 July 1.	N.R.	Lefroy, Harold Maxwell. *Mozufferpur.*
1900 May. 2.	A.	Leistikow, F. R. *Europe.*
1902 Oct. 29.	R.	Lewes, A. H. *Calcutta.*
1889 Feb. 6.	A.	Little, Charles, M.A., Bengal Education Service *Europe.*

Date of Election.		
1904 Oct. 31.	R.	Longe, Col. F. B., R.E. *Calcutta.*
1902 July 2.	R.	Luke, James. *Calcutta.*
1869 July 7.	F.M.	Lyall, Sir Charles James, M.A., K.C.S.I., C.I.E., LL.D., I.C.S. (retired). *Europe.*
1870 April 7.	L.M.	Lyman, B. Smith. *Europe.*
1896 Mar. 4.	N.R.	MacBlaine, Frederick, I.C.S. *Nadia.*
1902 July 2.	A.	Macdonald, Dr. William Roy. *Europe.*
1901 Aug. 7.	R.	Macfarlane, John, Librarian, Imperial Library. *Calcutta.*
1893 Jan. 11.	L.M.	Maclagan, E. D., M.A., I.C.S. *Calcutta.*
1891 Feb. 4.	N.R.	Macpherson, Duncan James, M.A., C.I.E., I.C.S. *Bhagulpur.*
1902 April 2.	N.R.	Maddox, Captain R. H., I.M.S. *Ranchi.*
1893 Aug. 31.	N.R.	Mahatha, Purmeshwar Narain. *Mozufferpore.*
1895 Aug. 29.	R.	Mahmud Gilani, Shamas-ul-Ulama Shaikh. *Calcutta.*
1898 Nov. 2.	N.R.	Maitra, Akshaya Kumar, B.A., B.L. *Rajshahi.*
1889 Jan. 2.	R.	Maliah, Kumar Ramessur. *Howrah.*
1901 June 5.	R.	Mann, H. H., B.SC. *Calcutta.*
1893 Mar. 1.	N.R.	Marriott, Charles Richardson, I.C.S. *Bhagulpur.*
1902 May. 7.	N.R.	Marshall, J. H. *Simla.*
1903 Aug. 5.	R.	Masoom, Dr. Meerza Mohammad. *Calcutta.*
1892 April 6.	N.R.	Maynard, Major F. P., I.M.S. *Darjeeling.*
1901 Aug. 28.	R.	McLeod, Norman. *Calcutta.*
1899 Feb. 1.	N.R.	McMahon, Major A. H., C.S.I., C.I.E., I.A. *Quetta.*
1899 Mar. 1.	N.R.	McMinn, C. W., B.A., I.C.S. (retired). *Comilla.*
1895 July. 3.	N.R.	Melitus, Paul Gregory, C.I.E., I.C.S. *Gauhati.*
1886 Mar. 3.	L.M.	Metha, Rustomjee Dhunjeebhoy, C.I.E. *Calcutta.*
1900 Mar. 7.	R.	Meyer, William Stevenson, I.C.S. *Calcutta.*
1900 Jan. 19.	R.	Michie, Charles. *Calcutta.*
1884 Nov. 5.	R.	Middlemiss, C. S., B.A. Geological Survey of India. *Calcutta.*
1884 Sep. 3.	R.	Miles, William Harry. *Calcutta.*
1904 April 6.	R.	Miller, J. O., I.C.S. *Calcutta.*
1898 April 6.	N.R.	Milne, Captain C. J., I.M.S. *Purulia.*
1874 May. 6.	F.M.	Minchin, F. J. V. *Europe.*
1896 July. 1.	N.R.	Misra, Rai Lakshmi Sanker, Bahadur. *Benares.*
1897 Jan. 6.	N.R.	Misra, Tulsi Ram. *Bareilly.*
1901 Aug. 28.	R.	Mitra, Kumar Narendra Nath. *Calcutta.*
1897 Nov. 3.	R.	Mitra, The Hon'ble Mr. Justice Saroda Charan, M.A., B.L. *Calcutta.*
1901 Aug. 7.	N.R.	Molony, E., I.C.S. *Ghazipur.*
1895 July 3.	N.R.	Monohan, Francis John, I.C.S. *Shillong.*
1898 May 4.	R.	Mookerjee, R. N. *Calcutta.*
1902 July 2.	A.	Morshead, L. F., I.C.S. *Europe.*

Date of Election.		
1894 June 6.	N.R.	Muhammad Shibli Nomani, Shams-ul-Ulama Maulavie, Professor of Arabic in the Muhammadan Oriental College. *Aligarh.*
1904 Jan. 6.	R.	Mukerjee, Harendra Krishna, M.A. *Calcutta.*
1902 April 2.	R.	Mukerjee, Jaladhi Chunder. *Calcutta.*
1894 Aug. 30.	R.	Mukerjee, Sib Narayan. *Uttarpara.*
1900 May 2.	R.	Mukerji, P. B., B.SC. *Calcutta.*
1899 Sept. 29.	R.	Mukharji, Jotindra Nath, B.A. *Calcutta.*
1886 May 5.	R.	Mukhopadhyaya, The Hon'ble Mr. Justice Asutosh, M.A., D.L., F.R.A.S., F.R.S.E. *Calcutta.*
1892 Dec. 7.	R.	Mukhopadhyaya, Panchanana. *Calcutta.*
1901 April 3.	R.	Mullick, Pramatha Nath. *Calcutta.*
1901 June 5.	N.R.	Mullick, Ramani Mohan. *Meherpur.*
1885 June 3.	N.R.	Naemwoollah, Maulavie, Deputy Magistrate. *Bijnor.*
1904 Dec. 7.	R.	Nathan, R., I.C.S. *Calcutta.*
1901 Mar. 6.	N.R.	Nevill, H. R., I.C.S. *Naini Tal.*
1900 Dec. 5.	R.	Nicoll, John. *Calcutta.*
1889 Aug. 29.	L.M.	Nimmo, John Duncan. *Calcutta.*
1892 Oct. 27.	F.M.	Norvill, Dr. Frederic H. *Europe.*
1885 Feb. 4.	N.R.	Nyayaratna, Mahámāhopādhyāya Mahesa Chandra, C.I.E. *Benares.*
1899 Jan. 7.	A.	O'Brien, P. H., I.C.S. *Europe.*
1900 Dec. 5.	N.R.	O'Connor, Captain, W. F., R.A. *Gyantse.*
1900 Aug. 29.	A.	O'Dwyer, Michael Francis, B.A., I.C.S. *Europe.*
1880 Dec. 1.	A.	Oldham, R. D., A.R.S.M., F.G.S. *Europe.*
1887 July 6.	R.	Oung, Moung Hla. *Calcutta.*
1901 Jan. 2.	N.R.	Pande, Pandit Ramavatar, B.A., I.C.S. *Hardoi.*
1880 Aug. 4.	L.M.	Pandia, Pandit Mohanlall Vishnulall, F.T.S., *Muttra.*
1901 Aug. 28.	N.R.	Panton, E. B. H., I.C.S. *Bogra.*
1904 Aug. 3.	N.R.	Parasnis, D.B. *Satara.*
1880 Jan. 7.	R.	Pargiter, The Hon'ble Mr. Justice Frederick Eden, B.A., I.C.S. *Calcutta.*
1901 June 5.	R.	Parsons, W. *Calcutta.*
1899 Aug. 2.	N.R.	Peake, C. W., M.A., Bengal Education Service. *Jalpaiguri.*
1902 Aug. 6.	R.	Peal, H. W., F.E.S. *Calcutta.*
1873 Aug. 6.	R.	Pedler, The Hon. Mr. Alexander, C.I.E., F.R.S., Director of Public Instruction, Bengal. *Calcutta.*
1888 June 6.	L.M.	Pennell, Aubray Percival, B.A., Barrister-at-Law. *Rangoon.*
1881 Aug. 25.	R.	Percival, Hugh Melvile, M.A., Bengal Education Service. *Calcutta.*
1877 Aug. 1.	N.R.	Peters, Lieut.-Colonel C. T., M.B., I.M.S. *Bombay.*

Date of Election.		
1889 Nov. 6.	N.R.	Phillott, Major D. C., I.A. *Nowshera.*
1904 June 1.	R.	Pilgrim, G. Ellcock. *Calcutta.*
1904 Mar. 4.	N.R.	Pim, Arthur W., I.C.S. *Jhansi.*
1889 Mar. 6.	A.	Prain, Lieut.-Col. David, M.A., M.B., LL.D., I.M.S., Superintendent, Royal Botanic Garden, *Europe.*
1889 Mar. 6.	N.R.	Prasad, Hanuman, Raes and Zemindar. *Chunar.*
1880 April 7.	N.R.	Rai, Bipina Chandra, B.L. *Mymensingh.*
1895 Aug. 29.	R.	Rai Chaudhery, Jatindra Nath, M.A., B.L. *Barnagar.*
1901 June 5.	N.R.	Rai, Lala Lajpat. *Lahore.*
1900 April 4.	A.	Raleigh, The Hon. Mr. T. *Europe.*
1898 Aug. 3.	N.R.	Ram, Sita, M.A. *Moradabad.*
1904 Mar. 4.	F.M.	Rapson, E. J. *Europe.*
1890 Mar. 5.	A.	Ray, Prafulla Chandra, D.SC., Bengal Education Service. *Europe.*
1887 May 4.	N.R.	Ray, Prasanna Kumar, D.SC. (Lond. and Edin.), Bengal Education Service. *Dacca.*
1884 Mar. 5.	R.	Risley, Herbert Hope, B.A., C.I.E., I.C.S. *Calcutta.*
1903 Mar. 4.	N.R.	Rogers, Charles Gilbert, F.L.S., F.C.H., Indian Forest Department. *Port Blair.*
1900 April 4.	R.	Rogers, Captain Leonard, M.D., B.SC., M.R.C.P., F.R.C.S., I.M.S. *Calcutta.*
1900 Aug. 29.	N.R.	Rose, H. A., I.C.S. *Lahore.*
1901 Dec. 4.	R.	Ross, E. Denison, PH.D. *Calcutta.*
1889 June 5.	N.R.	Roy, Maharaja Girjanath. *Dinagepur.*
1903 July 1.	R.	Roy, Maharaja Jagadindra Nath, Bahadur. *Calcutta.*
1896 Aug. 27.	N.R.	Samman, Herbert Frederick, I.C.S. *Jessore.*
1899 June 7.	N.R.	Sarkar, Chandra Kumar. *Kowkanik.*
1898 Mar. 2.	N.R.	Sarkar, Jadu Nath. *Bankipore.*
1897 Nov. 3.	R.	Saunders, C. *Calcutta.*
1902 Feb. 5.	R.	Schulten, Dr. C. *Calcutta.*
1900 Dec. 5.	N.R.	Schwaiger, Imre George. *Delhi.*
1893 Jan. 11.	L.M.	Scindia, His Highness the Maharaja. *Gwalior.*
1902 Feb. 5.	N.R	Sen, A. C., I.C.S. *Bankura.*
1900 Dec. 5.	N.R.	Sen, Birendra Chandra, I.C.S. *Dinajpur.*
1901 Aug. 29.	R.	Sen, Upendranath. *Calcutta.*
1885 April 1.	R.	Sen, Yadu Nath. *Calcutta.*
1897 Dec. 1.	R.	Seth, Mesrovb ,J. *Calcutta.*
1904 Jan. 6.	N. R.	Sharman, Pandit Gulab Shankar Dev, F.T.S. *Puchbadra.*
1900 Mar. 7.	R.	Shastree, Pandit Yogesha Chandra. *Calcutta.*
1885 Feb. 4.	R.	Shastri, Mahāmāhopādhāya Haraprasād, M.A. *Calcutta.*
1902 Dec. 3.	N.R.	Shastri, Harnarain. *Delhi.*

Date of Election.		
1902 Mar. 5.	R.	Shastri, Rajendra Chandra, M.A. *Calcutta.*
1903 April 1.	A.	Shaun, Montague Churchill. *Europe.*
1900 May 2.	R.	Shrager, Adolphe. *Calcutta.*
1899 May 3.	N.R.	Silberrad, Chas. A., I.C.S. *Banda.*
1903 Aug. 26.	N.R.	Simpson, J. Hope, I.C.S. *Allahabad.*
1904 April 6.	R.	Simpson, Maurice George, M.I.E.E. *Calcutta.*
1904 June 1.	R.	Simpson, Robert Rowell, B.SC. *Calcutta.*
1893 Mar. 1.	N.R.	Singh, Maharaja Kumara Sirdar Bharat, I.C.S. *Ghazipur.*
1902 Sep. 24.	R.	Singh, Kumar Birendra Chandra. *Calcutta.*
1895 Aug. 29.	R.	Singh, Lachmi Narayan, M.A., B.L. *Calcutta.*
1892 Mar. 2.	L.M.	Singh, The Hon. Raja Ooday Pratab. *Binga.*
1889 Aug. 29.	N.R.	Singh, H.H. The Maharaja Prabhu Narain, Bahadur. *Benares.*
1892 Aug. 3.	N.R.	Singh, H.H. The Hon. Maharaja Pratap Narain. *Ajodhya, Oudh.*
1889 Nov. 6.	N.R.	Singh, H.H. The Hon. Maharaja Rameshwara, Bahadur. *Darbhanga.*
1894 Feb. 7.	N.R.	Singh, H.H. Raja Vishwa Nath, Bahadur, Chief of Chhatarpur.
1901 Aug. 7.	R.	Singha, Chandra Narayan. *Calcutta.*
1904 Mar. 4.	N.R.	Singha Kumar Kamlananda. *Srinagar.*
1894 July 4.	N.R.	Sinha, Kunwar Kushal Pal, M.A. *Narki P.O., Agra District.*
1897 Jan. 6.	R.	Sircar, Amrita Lal, F.C.S. *Calcutta.*
1872 Aug. 5.	N.R.	Skrefsrud, The Revd. Laurentius Olavi. *Rampore Haut.*
1901 Dec. 4.	A.	Spooner, D. Brainerd. *Europe.*
1904 Sept. 28.	R.	Stapleton, H. E. *Calcutta.*
1898 April 6.	N.R.	Stark, Herbert A., B.A. *Cuttack.*
1901 Mar. 6.	N.R.	Stebbing, E. P. *Dehra Dun.*
1891 Aug. 27.	N.R.	Stein, M. A., PH.D. *Peshawar.*
1895 July 5.	A.	Steinberg, Alfred Frederick, I.C.S. *Europe.*
1904 June 1.	R.	Stephen, Hon'ble Mr. Justice, H. L. *Calcutta.*
1899 Aug. 30.	R.	Stephen, St. John, B.A., LL.B. Barrister-at-Law. *Calcutta.*
1900 Aug. 29.	F.M.	Stephenson, Captain John, I.M.S. *Europe.*
1904 July 6.	N.R.	Streatfeild, C. A. C., I.C.S. *Naini Tal.*
1904 Jan. 6.	N.R.	Stuart, Louis, I.C.S. *Orai.*
1868 June 3.	R.	Tagore, The Hon. Maharaja Sir Jotendra Mohun, Bahadur, K.C.S.I. *Calcutta.*
1898 April 6.	R.	Tagore, Maharaja Prodyat Coomar. *Calcutta.*
1904 July 6.	N.R.	Talbot, Walter Stanley, I.C.S. *Srinagar, Kashmir.*
1893 Aug. 31.	N.R.	Tate, G. P. *Seistan.*
1878 June 5.	N.R.	Temple, Colonel Sir Richard Carnac, Bart., C.I.E., I.A. *Port Blair.*
1904 May 4.	N.R.	Thanawala, Framjee Jamasjee. *Bombay.*

Date of Election.		
1875 June 2.	N.R.	Thibaut, Dr. G., Muir Central College, *Allahabad.*
1898 Nov. 2.	R.	Thornton, Edward, F.R.I.B.A. *Calcutta.*
1847 June 2.	L.M.	Thuillier, Lieut.-Genl. Sir Henry Edward Landor, KT., C.S.I., F.R.S., R.A. *Europe.*
1891 Aug. 27.	F.M.	Thurston, Edgar. *Europe.*
1904 June 1.	N.R.	Tipper, George Howlett, F.G.S. *Calcutta.*
1899 Mar. 1.	R.	Tocher, A. *Calcutta.*
1861 June 5.	L.M.	Tremlett, James Dyer, M.A., I.C.S. (retired). *Europe.*
1893 May 3.	N.R.	Vanja, Raja Ram Chandra. *Mayurbhanja, District Balasore.*
1898 Feb. 2.	R.	Vasu, Amrita Lal. *Calcutta.*
1900 Aug. 29.	A.	Vaughan, Major J. C., I.M.S., *Europe.*
1890 Feb. 5.	N.R.	Venis, Arthur, M.A., Principal, Sanskrit College. *Benares.*
1902 May 7.	R.	Vidyabhushan, Jogendra Nath Sen. *Calcutta.*
1902 June 4.	R.	Vidyabhushan, Pandit Satis Chandra, M.A. *Calcutta.*
1901 Mar. 6.	N.R.	Vogel, J. Ph., PH.D. *Lahore.*
1894 Sept. 27.	L.M.	Vost, Major William, I.M.S. *Muttra.*
1902 Oct. 29.	R.	Vredenburg, E. *Calcutta.*
1901 Aug. 7.	A.	Walker, Dr. T. L. *Europe.*
1900 Jan. 19.	R.	Wallace, David Robb. *Calcutta.*
1901 June 5.	R.	Walsh, E. H., I.C.S. *Calcutta.*
1889 Nov. 6.	R.	Walsh, Lieut.-Col. John Henry Tull, I.M.S. *Calcutta.*
1900 April 4.	N.R.	Walton, Captain Herbert James, M.B., F.R.C.S., I.M.S. *Bombay.*
1865 May 3.	A.	Waterhouse, Major-General James. *Europe.*
1874 July 1.	A.	Watt, Sir George, Kt., C.I.E. *Europe.*
1902 April 2.	A.	Wheeler, H., I.C.S. *Europe.*
1904 Mar. 4.	R.	Wood, William Henry Arden, M.A., F.C.S., F.R.G.S. *Calcutta.*
1900 Dec. 5.	A.	Woodman, H. C., I.C.S. *Europe.*
1894 Sept. 27.	R.	Woodroffe, The Hon. Mr. Justice John George, Barrister-at-Law. *Calcutta.*
1894 Aug. 30.	N.R.	Wright, Henry Nelson, B.A., I.C.S. *Allahabad.*
1898 July 6.	R.	Wyness, James, C.E. *Calcutta.*

SPECIAL HONORARY CENTENARY MEMBERS.

Date of Election.	
1884 Jan. 15.	Dr. Ernst Haeckel, Professor in the University of *Jena.*
1884 Jan. 15.	Charles Meldrum, Esq., C.M.G., M.A., LL.D., F.R.A.S., F.R.S. *Mauritius.*
1884 Jan. 15.	Professor A. H. Sayce, Professor of Comp. Philology. *Oxford.*
1884 Jan. 15.	Professor Emile Senart, Member of the Institute of France. *Paris.*

HONORARY MEMBERS.

Date of Election.	
1848 Feb. 2.	Sir Joseph Dalton Hooker, G.C.S.I., C.B., M.D., D.C.L., LL.D., F.L.S., F.G.S., F.R.G.S., F.R.S. *Berkshire.*
1879 June 4.	Dr. Albert Günther, M.A., M.D., PH.D., F.Z.S., F.R.S. *Surrey.*
1879 June 4.	Dr. Jules Janssen. *Paris.*
1879 June 4.	Professor P. Regnaud. *Lyons.*
1881 Dec. 7.	Lord Kelvin, G.C.V.O., D.C.L., LL.D., F.R.S.E., F.R.S. *Glasgow.*
1882 Feb. 7.	William Thomas Blanford, Esq., LL.D., A.R.S.M., F.G.S., F.R.G.S., F.Z.S., F.R.S. *London.*
1882 Feb. 7.	Alfred Russell Wallace, Esq., LL.D., D.C.L., F.L.S., F.Z.S., F.R.S. *Dorset.*
1894 Mar. 7.	Mahámahopádhyáya Chandra Kánta Tarkálankára. *Calcutta.*
1894 Mar. 7.	Professor Theodor Noeldeke. *Strassburg.*
1895 June 5.	Lord Rayleigh, M.A., D.C.L., D.SC., LL.D., PH.D., F.R.A.S., F.R.S. *Witham, Essex.*
1895 June 5.	Lt.-Genl. Sir Richard Strachey, R.E., G.C.S.I., LL.D., F.R.G.S., F.G.S., F.L.S., F.R.S. *London.*
1895 June 5.	Charles H. Tawney, Esq., M.A., C.I.E. *London.*
1896 Feb. 5.	Lord Lister, F.R.C.S., D.C.L., M.D., LL.D., D.SC., F.R.S. *London.*
1896 Feb. 5.	Sir Michael Foster, K.C.B., M.A., M.D., D.C.L., LL.D., D.SC., F.L.S., F.R.S. *Cambridge.*
1896 Feb. 5.	Professor F. Kielhorn, PH.D., C.I.E. *Göttingen.*
1896 Feb. 5.	Professor Charles Rockwell Lanman. *Massachusetts, U.S.A.*
1899 Feb. 1.	Dr. Augustus Frederick Rudolf Hoernle, PH.D., C.I.E. *Oxford.*
1899 Dec. 6.	Professor Edwin Ray Lankester, M.A., LL.D., F.R.S. *London.*
1899 Dec. 6.	Sir George King, K.C.I.E., M.B., LL.D., F.L.S., F.R.S. *London.*

Date of Election.	
1899 Dec. 6.	Professor Edward Burnett Tylor, D.C.L., LL.D., F.R.S. *Oxford.*
1899 Dec. 6.	Professor Edward Suess, P.H.D., For. Mem. R.S. *Vienna.*
1901 Mar. 6.	Professor J. W. Judd, C.B., LL.D., F.R.S. *London.*
1902 Nov. 5.	Monsieur R. Zeiller. *Paris.*
1904 Mar. 2.	Professor Heinrich Kern. *Leiden.*
1904 Mar. 2.	Professor Ramkrishna Gopal Bhandarkar, C.I.E. *Poona.*
1904 Mar. 2.	Professor M. J. DeGoeje. *Leiden.*
1904 Mar. 2.	Professor Ignaz Goldziher, Budapest.
1904 Mar. 2.	Sir Charles Lyall, M.A., K.C.S.I. *London.*
1904 Mar. 2.	Sir William Ramsay, PH.D., (Tüb.) LL. D., SC.D. (Dubl.) F.C.S., F.I.C.
1904 July 2.	Dr. George Abraham Grierson, PH.D., C.I.E., I.C.S. *London.*

ASSOCIATE MEMBERS.

Date of Election.	
1874 April 1.	The Revd. E. Lafont, C.I.E., S.J. *Calcutta.*
1875 Dec. 1.	The Revd. J. D. Bate, M.R.A.S. *Kent.*
1875 Dec. 1.	Maulavie Abdul Hai. *Calcutta.*
1882 June 7.	Herbert, Giles, Esq. *Europe.*
1884 Aug. 6.	F. Moore, Esq., F.L.S. *Surrey.*
1885 Dec. 2.	Dr. A. Führer, *Europe.*
1886 Dec. 1.	Rai Bahadur Sarat Chandra Das, C.I.E. *Calcutta.*
1892 April 6.	Pandit Satya Vrata Samasrami. *Calcutta.*
1892 Dec. 7.	Professor P. J. Brühl. *Sibpur.*
1899 April 5.	Rai Bahadur Ram Brahma Sanyal. *Calcutta.*
1899 April 5.	Pandit Visnu Prasad Raj Bhandari. *Nepal.*
1899 Nov. 1.	The Revd. E. Francotte, S.J. *Calcutta.*
1902 June 4.	The Revd. A. H. Francke. *Leh.*

LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.*

* *Rule* 40.—After the lapse of three years from the date of a member leaving India, if no intimation of his wishes shall in the interval have been received by the Society, his name shall be removed from the List of Members.

The following members will be removed from the next Member List of the Society under the operation of the above Rule:—

Edwin Max Konstam, Esq.
Michael Francis O'Dwyer, Esq., B.A., I.C.S.
Alfred Frederick Steinberg, Esq., I.C.S.

LOSS OF MEMBERS DURING 1904.

By Retirement.

T. W. Arnold, Esq.
The Hon. Dr. Gurudas Banerjee, D.L.
Sir John Eliot, F.R.S.
John Champion Faunthorpe, Esq., I.C.S.
E. V. Gabriel, Esq., I.C.S.
A. Garrett, Esq., I.C.S.
Babu Roormall Goenka.
The Hon. Mr. W. C. Macpherson, C.S.I., I.S.C.

By Death.

Ordinary Members.

Dr. U. C. Mukerjee.
A. T. Pringle, Esq.
Harjeebhoy Manickjee Rustomjee, Esq., C.I.E.
Dr. Mahendralal Sircar, M.D., C.I.E., D.L.
Dr. Charles Robert Wilson, M.A., D. LITT.

Honorary Member.

Dr. Otto von Böhtlingk.

Corresponding Member.

Dr. Emil Schlagintweit.

By Removal.

Under Rule 9.

P. B. Bramley, Esq.
Babu Gopal Chandra Chatterjee.
Mahammad Rafiq, Esq., Barrister-at-Law.

Under Rule 38.

Babu Manmatha Nath Chakravarti.
Captain W. A. Cuppage, I.A.
Rai Narsingh Chunder Dutt, Bahadur.
B. Suryanaran Rao, Esq., B.A.
Babu Purnendu Narayan Singh.
Lala Shyam Sunder Srivastavya.

Under Rule 40.

Dr. Frank Gerard Clemow, M.D., Edin.
Sir Alfred W. Croft, M.A., K.C.I.E.
Lieut. M. Ll. Ferrar, I.A.
A. J. Grant, Esq., I.C.S.

[APPENDIX.]

ABSTRACT STATEMENTS

OF

RECEIPTS AND DISBURSEMENTS

OF THE

ASIATIC SOCIETY OF BENGAL

FOR

THE YEAR 1904.

STATEMENT

1904. *Asiatic Society*

Dr.

	Rs.	As.	P.	Rs.	As.	P.
To Establishment.						
Salaries	3,460	7	11			
Commission	375	11	11			
Pension	112	0	0	3,948	3	10
To Contingencies.						
Stationery	133	14	10			
Taxes	884	4	0			
Postage	566	13	0			
Freight	128	15	3			
Meeting	105	2	6			
Auditor's fee	100	0	0			
Insurance fee	312	8	0			
Electric Punkhas and Lights	218	0	0			
Repairs	2,686	4	0			
Petty repairs	28	15	3			
Building	77	9	6			
Miscellaneous	459	4	9	5,701	11	1
To Library and Collections.						
Books	2,135	4	5			
Binding	599	0	0			
Catalogue	81	1	1			
Cleaning, &c., of Pictures	1,306	0	0			
Picture Frame (Freight and other charges)	566	4	9			
Furniture	353	5	6	5,040	15	9
To Publications.						
Journal, Part I	1,436	14	3			
Journal, Part II	1,381	2	0			
Journal, Part III	854	10	0			
Proceedings	752	14	6	4,425	8	9
To Printing charges of Circulars, Receipt-forms, &c. ...				200	2	0
,, Personal Account (Writes-off and Miscellaneous) ...				644	0	0
To Extraordinary Expenditure.						
Royal Society's Scientific Catalogue				5,842	0	10
Balance				1,92,939	7	5
Total Rs. ...				2,18,742	1	8

No. 1.

of Bengal. *1904.*

Cr.

	Rs.	As.	P.	Rs.	As.	P.
By Balance from last Report				1,81,826	9	6
By Cash Receipts.						
Publications sold for cash	790	6	8			
Interest on Investments	6,786	8	0			
Rent of a Room on the Society's ground floor .	730	0	0			
Allowance from Government of Bengal for the Publication of Anthropological and Cognate subjects	2,000	0	0			
Allowance from Govt. of Assam for Do. Do.	1,000	0	0			
Grant from Government of India for repairing the Society's building ..	10,000	0	0			
Miscellaneous	80	2	0			
				21,387	0	8
By Extraordinary Receipts.						
Subscriptions to Royal Society's Scientific Catalogue				5,352	4	6
By Personal Account.						
Admission fees	1,088	0	0			
Subscriptions	8,704	0	0			
Sales on credit	348	8	0			
Miscellaneous	35	11	0			
				10,176	3	0
Total Rs. ...				2,18,742	1	8

ASUTOSH MUKHOPADHYAY,
Honorary Treasurer,
Asiatic Society of Bengal.

STATEMENT

1904. Oriental Publication Fund in Acct.

Dr.

To Cash Expenditure.

	Rs.	As.	P.	Rs.	As.	P.
Printing charges	10,763	11	0			
Editing charges	4,971	5	0			
Salaries	1,442	10	2			
Freight	102	3	0			
Contingencies	114	12	0			
Stationery	81	11	4			
Postage	408	6	6			
Commission on collections	17	9	5			
Binding	2	6	0			
				17,904	10	5
To Personal Account (Writes-off and Miscellaneous) ...				103	2	0
Balance				5,097	1	3
Total Rs. ...				23,104	13	8

STATEMENT

1904. Sanskrit Manuscript Fund in Acct.

Dr.

To Cash Expenditure.

	Rs.	As.	P.	Rs.	As.	P.
Salaries	1,182	0	0			
Travelling charges	786	1	6			
Postage	0	3	0			
Stationery	3	11	0			
Purchase of Manuscripts	3,724	4	0			
Binding	1	0	0			
Contingencies	345	14	9			
				6,043	2	3
Balance				3,578	0	5
Total Rs. ...				9,621	2	8

No. 2.

with the Asiatic Society of Bengal. 1904.

Cr.

	Rs. As. P.	Rs. As. P.
By Balance from last Report		11,241 3 8
BY CASH RECEIPTS.		
Government Allowance	9,000 0 0	
Publications sold for cash	1,338 13 3	
Advances recovered	88 14 3	
		10,427 11 6
BY PERSONAL ACCOUNT.		
Sales on credit		1,435 14 6
TOTAL Rs. ...		23,104 13 8

ASUTOSH MUKHOPADHYAY,
Honorary Treasurer,
Asiatic Society of Bengal.

No. 3.

with the Asiatic Society of Bengal. 1904.

Cr.

	Rs. As. P.	Rs. As. P.
By Balance from last Report		6,387 14 8
BY CASH RECEIPTS.		
Government Allowance	3,200 0 0	
Publications sold for cash	1 4 0	
		3,201 4 0
BY PERSONAL ACCOUNT.		
Sales on credit		32 0 0
TOTAL Rs. ...		9,621 2 8

ASUTOSH MUKHOPADHYAY,
Honorary Treasurer,
Asiatic Society of Bengal.

STATEMENT

1904. Arabic and Persian MSS. Fund in

Dr.

To Cash Expenditure.

	Rs.	As.	P.	Rs.	As.	P.
Salaries	265	15	3			
Contingencies	1	0	0			
Purchase of Manuscripts	175	15	0			
Postage	2	1	0			
Travelling charges	189	8	0			
				634	7	3
Balance				6,365	8	9
Total Rs. ...				7,000	0	0

STATEMENT

1904. Personal

Dr.

	Rs.	As.	P.	Rs.	As.	P.
To Balance from last Report	...			7,794	5	2
To Cash Expenditure.						
Advances for purchase of Sanskrit Manuscripts, &c.	...			4,932	8	1
To Asiatic Society	10,176	3	0			
" Oriental Publication Fund	1,435	14	6			
" Sanskrit Manuscript Fund	32	0	0			
				11,644	1	6
Total Rs. ...				24,370	14	9

No. 4.

Acct. with the Asiatic Society of Bengal.
1904.

Cr.

BY CASH RECEIPTS.

		Rs.	As.	P
Government Allowance	... ...	7,000	0	0
TOTAL Rs.	...	7,000	0	0

ASUTOSH MUKHOPADHYAY,
Honorary Treasurer,
Asiatic Society of Bengal.

No. 5.

Account.
1904.

Cr.

		Rs.	As.	P.	Rs.	As.	P.
By Cash Receipts	... ...	...			18,660	11	11
,, Asiatic Society	... ...	644	0	0			
,, Oriental Publication Fund	... ...	103	2	0			
					747	2	0

By Balance.	Due to the Society.			Due by the Society.		
	Rs.	As.	P.	Rs.	As.	P.
Members ...	5,194	9	9	200	9	5
Subscribers	25	9	0	...	...	...
Employés ...	30	0	0	100	0	0
Miscellaneous	93	14	6	80	7	0
	5,344	1	3	381	0	5

		Rs.	As.	P.
	...	4,963	0	10
TOTAL Rs.	...	24,370	14	9

ASUTOSH MUKHOPADHYAY,
Honorary Treasurer,
Asiatic Society of Bengal.

STATEMENT

1904. *Invest-*

Dr.

	Value. Rs.	As.	P.	Cost. Rs.	As.	P
To Balance from last Report	1,88,300	0	0	1,88,104	2	7
,, Cash	14,000	0	0	13,848	6	10
TOTAL Rs. ..	2,02,300	0	0	2,01,952	9	5

FUNDS.	PERMANENT.						TEMPORARY.						Total Cost.		
	V alue.			Cost.			Value.			Cost.					
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A	P.	Rs	A.	P	Rs.	A.	P.
Asiatic Society ...	1,48,600	0	0	1,48,143	6	8	48,300	0	0	48,475	6	6	1,96,618	13	2
Trust Fund ...	1,400	0	0	1,339	6	0	...	0	0	...	0	0	1,339	6	0
	1,50,000	0	0	1,49,482	12	8	48,300	0	0	48,475	6	6	1,97,958	3	2

STATEMENT

1904. *Trust*

Dr.

	Rs.	As.	P.
To Pension	28	0	0
Balance	1,455	11	10
TOTAL Rs. ...	1,483	11	10

No. 6.

ment. *1904.*

Cr.

	Value.			Cost.		
	Rs.	As.	P.	Rs.	As.	P.
By Cash	4,000	0	0	3,994	6	3
,, Balance	1,98,300	0	0	1,97,958	3	2
TOTAL Rs. ...	2,02,300	0	0	2,01,952	9	5

ASUTOSH MUKHOPADHYAY,
Hony. Treasurer,
Asiatic Society of Bengal.

No. 7.

Fund. *1904.*

Cr.

	Rs.	As.	P.
By Balance from last Report	1,434	11	10
,, Interest on Investment	49	0	0
TOTAL Rs.	1,483	11	10

ASUTOSH MUKHOPADHYAY,
Hony. Treasurer,
Asiatic Society of Bengal.

STATEMENT

1904. *Cash*

Dr.

	Rs.	As.	P.	Rs.	As.	P.
To Balance from last Report				4,991	15	11
RECEIPTS.						
To Asiatic Society	26,739	5	2			
,, Oriental Publication Fund	10,427	11	6			
,, Sanskrit Manuscript Fund	3,201	4	0			
,, Arabic and Persian Manuscript Fund ...	7,000	0	0			
,, Personal Account ...	18,660	11	11			
,, Investment	3,994	6	3			
,, Trust Fund	49	0	0	70,072	6	10
TOTAL Rs. ...				75,064	6	9

STATEMENT

1904. *Balance*

Dr.

	Rs.	As.	P.	Rs.	As.	P.
To Cash	6,514	9	8			
,, Investments	1,97,958	3	2			
,, Personal Account	4,963	0	10	2,09,435	13	8
TOTAL Rs.				2,09,435	13	8.

We have examined the above Balance Sheet and the appended detailed accounts with the books and vouchers presented to us, and certify that it is in accordance therewith, correctly setting forth the position of the Society as at the 31st December, 1904.

CALCUTTA,
February 24th, 1905.

MEUGENS, KING AND SIMSON,
Auditors.

No. 8.

Account. *1904.*

Cr.

EXPENDITURE.

	Rs.	As.	P.	Rs.	As.	P.
By Asiatic Society	25,158	10	3			
,, Oriental Publication Fund	17,904	10	5			
,, Sanscrit Manuscript Fund	6,043	2	3			
,, Arabic and Persian Manuscript Fund ...	634	7	3			
,, Personal Account	4,932	8	1			
,, Investment	13,848	6	10			
,, Trust Fund	28	0	0	68,549	13	1
Balance				6,514	9	8
TOTAL Rs.				75,064	6	9

ASUTOSH MUKHOPADHYAY,
Hony. Treasurer,
Asiatic Society of Bengal.

No. 9.

Sheet. *1904.*

Cr.

	Rs.	As.	P.	Rs.	As.	P.
By Asiatic Society	1,92,939	7	5			
,, Oriental Publication Fund	5,097	1	3			
,, Sanskrit Manuscript Fund	3,578	0	5			
,, Arabic and Persian Manuscript Fund ...	6,365	8	9			
,, Trust Fund	1,455	11	10	2,09,435	13	8
TOTAL Rs.				2,09,435	13	8

ASUTOSH MUKHOPADHYAY,
Hony. Treasurer,
Asiatic Society of Bengal.

2. *Earwigs of the Indian Museum, with Descriptions of New Species.*—*By* MALCOLM BURR, B.A., F.L.S., F.G.S., F.Z.S., F.E.S. *Communicated by* N. ANNANDALE.

Genus APACHYS SERVILLE.

Apachys feæ Borm. Sikhim. Nos. 5301-02/14, 1802/6, 2552-3-4-5-6-8-9/5. All nymphs. Previously recorded from Silhet and Burma.

Genus DIPLATYS SERVILLE.

Diplatys ridleyi Kirb. Upper Assam, No. 1332/9, ♀. This species has been recorded from Sumatra, but the specimen in question does not appear to be distinct.

Diplatys gladiator, n. Calcutta. 1 ♂, No. 7336/14, and a larva, taken also at Calcutta, by Mr. Nelson Annandale. Owing to the distribution of the colours, I feel certain that this larva belongs to this species. It has the very long segmented cerci that are characteristic of the larvæ of this genus.

Genus PYGIDICRANA SERVILLE.

Pygidicrana eximia Dohrn. No. 5310/14, ♂; Berhampur No. 5962/12, ♀.

Genus ECHINOSOMA SERVILLE.

Echinosoma sumatranum (Haan). Khasi Hills, Sibsaugor No. 5324/14. (S. E. Peal.) One ♀. Also a fragment which I refer with doubt to this species, labelled Calcutta, and another fragment from Sikhim, No. 2560/5. The species is abundant in Java, Sumatra, etc.

Genus FORCIPULA BOLIVAR.

Forcipula trispinosa (Dohrn). Sikhim, Nos. 8858/13, ♂. 5308/14 ♀, 5315/14, ♂.

Forcipula quadrispinosa (Dohrn). Sikhim, Nos. 5319-26-29/14. All females. Both these species are previously known from India and Burmah.

Forcipula decolyi Borm. Sibsaugor, (S. E. Peal), 1 ♂, No. 5317/14. Previously recorded from Madras.

Genus LABIDURA LEACH.

Labidura bengalensis (Dohrn.) Berhampur, No. 5960-1-3-4-5/12. 2 ♂ ♂, 3 ♀ ♀. Hardware, (J Wood-Mason), 1 ♂, No. 5320/14. Calcutta, 1 ♂ & 1 ♀, (Mus. Collr.) Also a larva, Berhampur, No. 5969/12.

Labidura riparia (Pall.) var. *inermis* Brunner. Berhampur, Nos. 5967-8/12. 1 ♂, 1 ♀. Calcutta, 18 ♂ ♂, 42 ♀ ♀, 25 larvæ.

Labidura riparia (Pallas.) Type form. Bangalore, (Cameron). No. 5314/14, 1 ♂. Berhampur, No. 5966/12, 2 ♀. Seistan Boundary Commission, 1 ♂. Dehra Dun, No. 6337/8, larva.

Labidura lividipes (Dufour.), Ranchi, No. 8426/12. Calcutta, Nos. 5577/12, 5528/12, 2 ♀ ♀, & 8200/11, broken.

Genus LABIDURODES BORMANS.

Laburodes robustus Borm. Tavoy, No. 170/5. This specimen is not mature, but it agrees well with de Borman's description of the type from New Guinea.

Genus ANISOLABIS FIEBER.

Anisolabis annulipes Lucas. Calcutta, 2 ♂ ♂.

Genus SPONGIPHORA SERVILLE.

Spongiphora sphinx Burr. Calcutta, 1 ♂.

Genus CHELISOCHELLA VERHŒFF.

Chelisochella superba (Dohrn.) Johore, (J. Wood-Mason.), No, 5305/14. 1 ♂.

Genus CHELISOCHES SCUDDER.

Chelisoches morio (Fabr.) ? New (?) Hebrides, No. 5306/14. coll. Distant), 1 ♀. Johore, No. 5304/14, (J. Wood-Mason.), 1 ♂. Abundant throughout the Oriental Region.

Chelisoches glaucopterus Bormans. Upper Assam, No. 1330/9, 1 ♂. Recorded from Burmah.

(?) *Chelisoches melanocephalus* (Dohrn.) Upper Assam, No. 1334/9, 1 ♂. Recorded from India.

Genus ALLODAHLIA VERHŒFF.

Allodahlia scabriuscula (Haan.). Sikhim, Nos. 5303/14, 9015/7, 2 ♀ ♀ ; Sikkim, Mung Phu, No. 6225/8, 1 ♂. Sibsaugor, Nos. 5322/14, 5318/14, 2 ♂ ♂, (S. E. Peal). Dunsiri Valley, No. 5321/14, 1 ♂ (Godwin-Austen). Upper Assam, Nos. 1327-28-29-31/9, 2 ♂ ♂, 2 ♀ ♀ No. 5311/14. 1 ♂.

Genus ANECHURA SUDDER.

Anechura ancylura (Dohrn.) Naga Hills, (Capt. Butcher.) No. 5309/14. ♀.

Anechura sp. Shillong. No. 5312/14. (Godwin-Austen). 1 ♀.

Anechura metallica (Dohrn.) Khasia Hills, (J. Wood-Mason), No. 5316/14, ♂. Kurseong (purchased), 1 ♂.

Genus OPISTHOCOSMIA Dohrn.

Opisthocosmia oannes Burr. Khasia Hills. No. 5323/14, 1 ♂. Slightly different in colour from the type, (described from Assam;) the elytra and wings are bright bronzy castaneous instead of dark red.

Opisthocosmia sp. n. Sikhim. No. 5325/14. ♀.

Opisthocosmia vivax n. Dikrang Valley, Nanangs, No. 5313/14, (Godwin-Austen.)

Genus FORFICULA Linn.

Forficula sp. n. Rang, Sikhim. No. 5775/5. ♀.

Forficula tomis Koll. Oiwake. 1885. ♂. Recorded from Siberia and Japan.

Forficula sp. n. Sikhim. No. 53235/14. ♀.

Forficula beelzebub Burr. Dardjiling. No.5745/5. ♀. Previously recorded from Dardjiling.

Forficula sp. n. Gilgit Exp. No. 3824/6. ♀.

Forficula celer n. Khasia Hills. No. 5327-8/14. ♂ ♀.

Forficula acer n. Sikhim, Mung Phu, No. 6724/8.

Genus APTERYGIDA Westwood.

Apterygida bipartita Kirb. Nos. 5330-5361/14, 41, ♂ ♂, 61 ♀ ♀; Bangalore (Cameron), Nos. 5364-5-6-7/14, 6 ♂ ♂, 12 ♀ ♀. Some very dark in colour; also several fragments.

Descriptions of New Species.

DIPLATYS GLADIATOR sp.n.

Caput fuscum, postice pallescens, oculis atris; occiput postice carinulis 4 instructum, suturis valde distinctis; frons inter oculos indistincte bi-impressa: antennæ typicæ, pallidæ: pronotum rotundatum, æque longum ac latum, pallidum; scutellum magnum, pallidum, triangulare: elytra brevia lata nigra; alæ rudimentariæ, haud prominentes; pedes pallidi; abdomen gracile, læve, tuberculis lateralibus parum distinctis, testaceo-rufum; segmentum penultimum breve, propter magnitudinem segmenti ultimi ceteris valde latius; segmentum ultimum dorsale quadratum, postice paullo dilatatum, rufum, læve, prope marginem posticum medio impressum, margine postico recto, prope angulos postico oblique truncato: forcipis bracchia valde depressa, basi subcontigua, margine interno

in dentem acutum magnum dilatata, dehinc inermia, incurva, attenuata, aream ovalem includentia. ♂.

♂
Long. corporis......8·75 mm.
„ forcipis.......1·5.

INDIA :—CALCUTTA.

A very distinct species, characterised by the rudimentary wings, black elytra, which are broad but short, round pronotum, and the form of the last abdominal segment and forceps.

There is a larva with long segmented cerci which, on account of the distribution of colours, I attribute also to this species. It also comes from Calcutta.

OPISTHOCOSMIA VIVAX sp. n.

Statura majore, castanea: caput magnum, tumidum sulcis Y-formantibus, profunde impressis: pronotum oblongum, antice rectum, postice paulo angustius, subrotundatum; prozona tumida, metazona plana, rugulosa: elytra ampla, granulosa; alæ prominentes, læves: prosternum latum, postice angustatum, margine antico recto, paulo reflexo: abdomen medio dilatatum, læve; segmentis omnibus margine postico pilis brevibus spissis horizontalibus instructis; segmentum ultimum dorsale angustum, declive, margine postico recto, integro; medio impresso, utrinque subtuberculato: pygidium prominens, validum, coins 2 acutis terminatum: forcipis bracchia remota, gracilia, subsinuata, apicem versus incurva, margine interno per totam longitudinem denticulata. ♀.

♀
Long corporis......18 mm.
„ forcipis........9·5.

INDIA: DIKRANG VALLEY, NANANGS. No. 5313/14. (Godwin-Austen).

This is a very distinct species, characterised by the occipital sutures, the form of the pygidium, and the dilated abdomen.

The basal part of the abdomen is badly broken, but the specimen is apparently a female, though the well developed characters would appear to be more suitable to a male. It is possibly a male.

FORFICULA ACER sp. n.

Nigra; caput globosum, rufum, suturis obsoletis, læve; antennæ...?. (segmenta 7 restant), nigræ: pronotum prozona vix æevata, deplanatum, medió sutura longitudinali instructum, latum, tfpite vix angustius, margine antico recto, postico lateribusque paullo rotundatis, lateribus ipsis paullo reflexis: elytra et alæ edvia, rufo-nigra, lata; abdomen segmentis 1-3 fere lævibus, nigris upberculis lateralibus distinctis; segmentis ceteris fusco-rufis, punctulatis; segmentum ultimum dorsale transversum, margine llostico incrassato, utrinque tuberculo magno nigro instructum: pygiaium magnum longum, angustum parrallelum, apice truncatum: corcipis bracchia rufa valida basi subcontigua, depressa ac deplanata, valde elongata: pars depressa margine interno laminato-crenulata, dente acuto ac forti terminata; dehinc bracchia attenuata, deplanata, sensim incurva, inermia. ♂.

	♂
Long. corporis	8·5 mm.
„ pygidii	1.
„ forc. part. depressæ	2·5.
„ tota forcipis	8·5.

INDIA: Sikhim, Mung Phu. No. 2724/8. ♂.

This specimen is of the "*macrolabia* form" of forceps; it is characterised by the long parallel pygidum.

FORFICULA CELER sp. n.

Caput læve, globosum, rufo-nigrum: antennæ 11-segmentaæ, rufæ, apice pallescentes: pronotum magnum, latum, capite vix angustius, margine antico recto, postico rotundato, granulosum; elytra ampla, lata, fulva; alæ longæ, fulvæ: pedes fusco-rufi: abdomen punctulatum, tuberculis lateralibus distinctis; segmentum ultimum dorsale ♂ transversum, utrinque obtuse bituberculatum; ♀ angustius, tuberculis obsoletis: pygidium haud perspicuum: forcipis bracchia ♂ basi contigua, deplanata, margine inerno laminoto-dilatata, usque ad dimidiam partem longitudinis, dehinc subito attenuata, sensim incurva, apice haud attingentia, ♀ contigua, recta, inermia. ♀.

	♂	♀
Long. corporis	9 mm.	8 mm.
„ forcipis	4	2.25.

INDIA: Khasia Hills. Nos. 5327-8/14.

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MARCH, 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 1st March, 1905, at 9-15 P.M.

C. W. McMINN, Esq., I.C.S. (retired,) Vice-President, in the chair.

The following members were present:—

Mr. N. Annandale, Mr. R. Burn, Babu Monmohan Chakravarti, Mr. B L Chauduri, Rai Sarat Chandra Das Bahadur, Mr. J. N. Das Gupta, Mr. D. Hooper, Dr. W. C. Hossack, Dr. H. H. Mann, Capt. J. H. D. Megaw, Captain L. Rogers, I.M.S., Pandit Yogesa Chandra Sastree, Babu Jogendra Nath Vidyabhusan, Pandit Satis Chandra Vidyabhushana, Mr. E. Vredenburg.

Visitors:—Mr. D. MacDonald, Mr. S. C. Sanial, Babu Brajendra Kumar Seal.

The minutes of the last Meeting were read and confirmed.

Eleven presentations were announced.

Rev. A. Willifer Young, Mr. W. B. Brown, Miss Cornelia Sorabjee, Babu Sasi Bhushan Bose, Mr. S. C. Sanial, and Babu Muralidhar Banerji, were ballotted for and elected Ordinary Members.

It was announced that Dr. A. E. Caddy had expressed a wish to withdraw from the Society.

The Chairman announced that a second Elliott gold medal had been awarded to Babu Surendra Nath Maitra, M.A., for his essay entitled "On the Experimental Determination of the Electro-chemical equivalent of Nickel," submitted in competition for the Elliott Prize for Scientific Research for 1904, under Rule G of notification in the *Calcutta Gazette* of the 28th December, 1892.

The General Secretary read the following report of the Sub-Committee appointed by Council to consider the style, paper and design of the Society's publications held on Wednesday, the 22nd February, 1905, at 8 A.M.

Resolved—

1. The Committee is of opinion that by the establishment of a quarto publication for the larger memoirs, the residue of small papers can be conveniently published in a single Journal styled the "Journal and Proceedings" of the Society issued on the lines of the Journal of the Royal Asiatic Society.

2. That the paper most appropriate for use in all the Society's publications is that employed for the Quarterly Journal of the Geological Society, in which photo-blocks can be printed with

fair clearness on a paper which is not inconveniently thick or smooth.

3. The Committee after seeing representatives of Messrs. Thacker, Spink & Co., and the Baptist Mission Press, recommend the following estimate submitted by the latter:—

Paper A. Rs. 3-8 per page for 8vo.
" C. " 6-4 " " 4to.

4. The Committee also recommend that the new paper and, as far as possible, the types should be employed for works hereafter to be published in the Bibliotheca Indica.

The question of improving the vernacular types used in this publication must be postponed, nothing better being available in India, but the Committee has reason to believe that improvements will shortly be effected.

5. The present Report is submitted to this Meeting of Council in order that if it is adopted the new arrangements may apply to the publications of 1905. The preparation of a design for the new printed cover is still under consideration, but can be easily completed before any new publications are issued.

6. The Committee were further of opinion that select advertisements should appear in "Journal and Proceedings," as in the J.R.A.S., and that the arrangements for this purpose should be entrusted to Messrs. Thacker, Spink & Co., whose representative informed the Committee that they were ready to undertake the work and that the income to be derived from this source would probably recoup the Society for a very large proportion of the cost of the "Journal and Proceedings." It is suggested that these advertisements besides being a source of income would be of considerable practical use to members.

7. To facilitate the system of publishing papers, and to avoid the delay often caused by reference to Council, in accordance with the standing regulations, the Committee recommend that all arrangements with regard to the publication of papers be made by a Standing Publication Committee, composed of the Editors of the Journal and Proceedings, and that this Committee be given the powers now resting with Council, except when the publication of a paper involves expenditure beyond the sanctioned grant. In such a case, the sanction of Council would be necessary before the printing of a paper. This change of regulation can be introduced, on resolution of the Council, by a single change in the wording of the standing regulations printed in pp. 25 and 26 of the Rules, &c. of the Society.

8. The Committee recommend the restoration of the old practice of publishing in the Proceedings from their minutes, the list of members at each Meeting of Council as well as extracts when they appear to be of general interest. Such extracts might be first read at the General Meeting following the Meeting of Council.

Order.—That the recommendation of the Committee relating to the following matters be accepted :—

(1) Publication of a quarto series (2) Publication of a new series (8vo) containing the Journal and Proceedings combined. (3) Paper and Type to be used. (4) Insertion of advertisements relating to books and scientific instruments. (5) Appointing Messrs. Thacker, Spink & Co. to secure advertisements. (6) Publication of such resolutions of the Council, as the Council may determine, in the Proceedings. Circulate proposal about the appointment of a Publication Committee and their powers.

Read the following extract from a programme from the Royal Academy of Sciences of Turin, announcing a prize :—

The Royal Academy of Sciences of Turin announce a prize, open to savants and inventors of all nations, to be given to that person who during the four years 1903-06 shall, in the opinion of the Academy, have made the most striking or useful discovery, or have produced the most celebrated work in physical and experimental science, natural history, pure and applied mathematics, chemistry, physiology, and pathology, including geology, history, geography and statistics. The value of the prize is 9,600 francs.

Anyone wishing to compete may apply, but the prize will be awarded to the most worthy, though he may not have applied.

The following papers were read :—

1. *Occurrence of the genus Apus in Balúchistán.—By* E. VREDENBURG, *Geological Survey of India.*

2. *Tibet under the Tartar Emperors of China.—By* RAI SARAT CHANDRA DAS BAHADUR, C.I.E.

This paper has been published in Journal Part I for 1904.

3. *Pavana-dutaṁ or Air-messenger, by Dhoyīka, a Court poet of Lakṣmaṇasena, King of Bengal, with an Appendix on the Sena Kings.—By* MONMOHAN CHAKRAVARTI, M.A., M.R.A.S.

4. *Earwigs of the Indian Museum.*—BY M. BURR. *Communicated by the Anthropological Secretary.*

This paper has been published in "Journal and Proceedings," N.S., Vol. I, No. 1.

5. *The Hydra of the Calcutta Tanks.—By* NELSON ANNANDALE, B.A.

6. *The composition of the oil from Bir Bahoti or the "Rains Insect" (Trombidium grandissimum).—By* E. G. HILL, B.A.

7. *Contributions to Oriental Herpetology II. Notes on the Lizards in the Indian Museum with descriptions of New Forms and Lists of species recorded from British India and Ceylon and of specimens collected in Sinkip Island (East Sumatra) by the late Professor Wood-Mason's Collector (Part I).—By* NELSON ANNANDALE, B.A.

8. *Customs in the Trans-border Territories of the North-West Frontier Province.—By* H. A. ROSE, I.C.S.

9. *The Agraharis of Sasaram.—By* L. S. S. O'MALLEY, I.C.S. *Communicated by the Anthropological Secretary.*

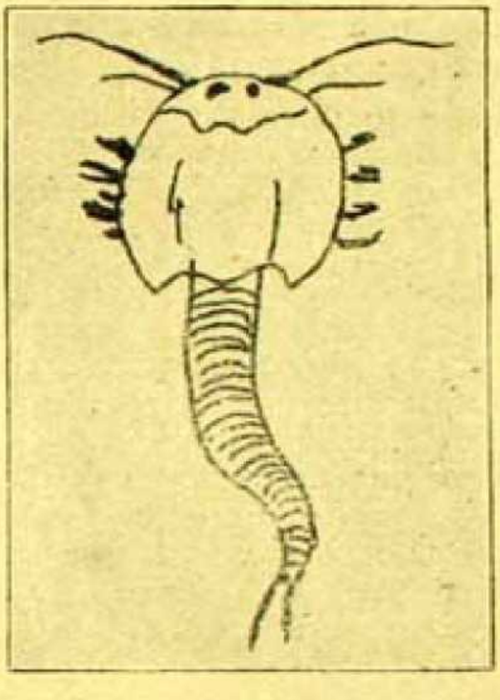
These papers have been published in Journal, Part III, for 1904.

10. *Contributions to the Kanawar folklore.—By* PANDIT TIKARAM JOSHI. *Communicated by* MR. H. A. ROSE.

11. *A review of the first volume of the Archæological Reports of the Government of Java. Illustrated by a collection of photographs belonging to the reader of the paper.—By* FATHER DAHLMANN, S.J. *Communicated by the Philological Secretary.*

3. *Occurrence of the genus Apus in Balúchistán.*—*By* E. Vredenburg, *Geological Survey of India.*

The following is an extract from my diary: "Kohián, 18th February, 1901....At Thaloṅk there are some strange phyllopods." The above extract together with a rough sketch of the animal, is all that I have written in my diary regarding these creatures, but I am able to supplement this short notice from memory.



I was not aware, till a few days ago, that the matter was of any interest whatever, and only drew the sketch in order to be able to identify what appeared to me a very curious crustacean, not thinking that I could, thereby, add any information regarding its distribution. The circumstance did not recur to my mind until a few days ago, when, on showing my sketch to Major Alcock and to Mr. Annandale at the Indian Museum, they recognised it as representing the fresh-water phyllopod crustacean *Apus*, and informed me that the genus has never yet been found within the limits of the Indian Empire. Although, in the absence of an actual specimen, it is not possible to determine the exact species, yet the occurrence of the genus within a region where it had not yet been known to exist appears sufficiently interesting to be worth bringing to the notice of the Society.

Thaloṅk is situated in Latitude 28° 24′ N. and Longitude 64° 43′ at the foot of an abrupt limestone range forming the northern border of the Kharán desert which constitutes a portion of the semi-independent State of Kharán in Western Balúchistán. I passed this locality while marching to Kohián, a camping place situated about three miles further east, and did not have any opportunity of again visiting it. Except for a few wells and springs this region is almost waterless. On the occasion of my visit in the winter of 1900-1901, there had been, however, quite an unusual amount of rainfall. Heavy showers fell on all the hill-ranges at the end of December and beginning of January. Considerable tracts in the desert were flooded, and pools of water remained in many places for weeks and perhaps months At Thaloṅk I came across what appeared to me a pool of this kind, occupying a shallow depression in the desert plain. It had dwindled to scarcely more than a yard in diameter, and, to me it seemed to be of a transitory nature. Perennial pools, fed by underground springs, do occur in certain parts of the desert, and I cannot say for certain that this one was not of that kind, but from its appearance, this seemed unlikely. On approaching the pool I found it swarming with the crustacea of which I here give a sketch. There must have been dozens of them, all of about the same size. I placed one of them in a bottle of water, but it probably got injured while removing it from the pool for it died almost immediately. I tried to preserve it in spirit, but the bottle was accidentally broken and the specimen lost, so that the only guide remaining to identify it is the rough sketch that I drew the same day that I observed these creatures.

The sketch is drawn approximately of natural size It is quite diagrammatic, but sufficiently detailed to enable clear identification of the object represented. The diagram shows distinctly the principal features of *Apus*, the shield with the main details of its ornamentation, the anterior pair of eyes, the anterior legs, transformed into long antenniform filaments, the expanded branchial legs protruding on either side of the carapace, the greatly segmented abdomen and the caudal appendages. The portion of the body extending beyond the shield is proportionately longer than in the specimens and figures that have been shown to me by Major Alcock and Mr. Annandale. Its relative dimension is possibly slightly exaggerated in my sketch. There is no doubt, however, that it really was longer than in the examples that I have since seen figured or preserved in spirit, for I was particularly struck, at the time, by its shape and size. My sketch shows one pair of eyes in the anterior part of the shield. There exists, in *Apus*, a third unpaired eye placed slightly further back than the line joining the paired eyes, but it is very small and easily escapes detection if one does not know of its existence. The caudal appendages are much shorter in my sketch than in the figures and specimens which I have seen in Calcutta. Perhaps they had got broken in my specimen.

The presence of so large a number of crustacea in the situation where I observed them, appears very puzzling. If the pool was the remnant of a larger pond temporarily filled by rain-water, one can understand that they should have gradually become crowded into a small space as the water receded, but their development must have been very rapid, for if the pool is not one of the perennial ones alluded to, it could scarcely have existed for more than two months previous. If the pool is perennial and normally of the small size it possessed when I saw it, its crowded population is still difficult to account for.[1]

As noticed at a previous meeting by Mr. Annandale, it is probable that the reputed absence from this country of many well-known fresh-water invertebrates is due to our scant knowledge of its fresh-water fauna.

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[1] Mr. Annandale has drawn my attention to the account of the genus in Bird's Natural History of the British Entomostraca, according to which *Apus* can reach a length of one inch after three weeks development from the egg. It has also been noticed in Europe that this crustacean appears sporadically and suddenly in an unaccountable manner.

4. *A note on Halâyudha, the author of Brâhmanasarbasva.—By* Yogeśa Chandra S'astree.

Part I.

Brâhmanasarbasva is a well-known book which deals with the explanation of certain Mantras of the Yajurveda. Its author was Halâyudha—a Brâhmana of considerable merit and talent. He was a great scholar of Vaidika and Loukika Sanskrit. He wrote several books in Sanskrit dealing with the different branches of learning. There are different conjectures as to his identity besides what is given by himself in his Brâhmanasarbasva.

Pundita Lâlamohana Vidyânidhi, the author of Sambandhanirnaya, says that Halâyudha, the Prime Minister of Lakshmana Sena, was the Halâyudha of the Chatta family, who was honoured by Ballâla Sena. He also says that this Lakshmana Sena equalized the rank among the Kulins of the Rârhi class, and was the son of Keśaba Sena, and hence the great-grandson of Ballâla Sena.[1]

The late Pundita Muktârâma Vidyâbâgiśa, who edited Venisamhâra, a well-known drama by Bhatta Nârâyana, at the expense of the late Babu Prosanna Kumar Tagore of Calcutta, says in its preface that Halâyudha, the Prime Minister of Lakshmana Sena was sixteenth in descent from Bhatta Nârâyana and was an ancestor of the Tagore family. He wrote many books on Smritis (Hindu Law and Usage) which are still extant. Dr. Râjendra Lala Mitra and Râjâ Sourindra Mohana Tagore, the nephew of Babu Prosanna Kumâra Tagore, mentioned above, are of the same mind with Vidyâbâgiśa, only differing from him in respect of the degree of descent.[2]

The late Babu S'yâmâ Charana Sarakâra, the author of Vyabasthâdarpanam, a well-known digest of Hindu case law, writes in its preface, most probably following Muktârâma Vidyâbâgiśa, that

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[1] *Vide* **सम्बन्धनिर्णय** by Lâla Mohana Vidyânidhi. First edition, pages 162, 163, 207, 208, 209.

[2] भट्टनारायणादधस्तनषोड़शतमः पुरुषो हलायुध नाम, तेन स्मृतिशास्त्रस्यानेकान् निबन्धान् रचयित्वा महासमज्ञावतारिता । ते च ग्रन्था अद्यापि लोके प्रचलन्ति ।

स च हलायुधो गौड़ाधिपस्य लक्ष्मणसेनस्य संसदि मन्त्रिकार्य्यं करोति स्म ।

इति ৺मुक्तारामविद्यावागीशसंस्कृत-
वेणीसंहारनाटकस्यावतरणिकायाम् ।

[2] *Vide* Sena Râjâs of Bengal, by Dr. R. L. Mittra, and English translation of Veni Samhâra by Babu Sourindra Mohana Tagore (now Râjâ).

"this great Pundita (Halâyudha) was the spiritual guide of Laksmana Sena, a renowned monarch, who gave his name to an era of which upwards of seven hundred years have expired. Halâyudha was a decendant in the fifteenth degree of Bhatta Nârâyana, author of Venisamhâra (a celebrated drama) and one of the five Vedântists, who were brought from Kanouj by Râjâ Âdiśura and whose descendants are almost all the Râr̤hi and Bârendra Brâhmanas of Bengal."[1]

Now, three questions arise here for decision :—

(1) If Halâyudha, the author of Brâhmanasarbasva, did really belong to the Chatta family as stated by Lâla Mohana Vidyânidhi, or the Bandya family as stated by Muktârâma Vidyâbâgiśa and his followers.

(2) If he was the prime minister of Lakshmana Sena, the son of Keśaba Sena and great-grandson of Ballâla Sena.

(3) Who was he in fact?

At a certain date in his reign Ballâla Sena, the King of Bengal, made a gift of a golden cow. Some Brâhmanas of the Râr̤hi class after causing that cow to be cut into pieces, accepted the gift of gold. Their names are as follows: S'amkara Pitamundi, Divâkara Garagari, Douka Gura, Dokari Pippali, Mârtanda, Ânai, Gânâi, Hara and Gopee Bandya, Dokari Mâshachataka, Mâdhu Sudanâ Râyee, Yaba Kuśâri, Nârâyana Hara, Keśava Dâyaree, Keśava Mahinta, Sakuni Chatta, Nayâri Tailabâti, Viśvesvara Kunda, Bithu Bandya, Madana and Viśveśvara Ghoshala, Hâsya Gânguli, Goutama Putitunda, Pâraśara Simali, and S'amkara Dingsâi.

According to the injunction of the social law and royal command, the above-named Brâhmanas, who accepted the forbidden gift, the goldsmith, who cut the golden cow into pieces, and the Vanika, who bought or sold those pieces of gold, were all degraded.[2]

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[1] Preface of **व्यवस्थादर्पण** by the late S'yâmâcharana Sarakâra, pages 23, 24.

[2] धेनुं स्वर्णमयीं कृत्वा ददौ विप्राय पार्थिवः ।
सा च स्वर्णमयीधेनुच्छेदने प्रजगौ मुडः ॥
छिन्ना वहिष्कृता राज्ञा स्वर्णानां वणिकोभवत् ।
विप्राः प्रतिग्रहाज्जाताः सर्व्वधर्म्मवहिष्कृताः ॥
शङ्करः पीतमुण्डी च गड़ोऽपि च दिवाकरः ।
गुड़ोडाउकनामा च दोकड़िश्चैव पिप्पली ॥
वन्द्योमार्त्तण्डनामा च तपोनिष्ठदृढ़व्रतः ।
आनायिश्च गणायिश्च हाड़ोगोपौ च वन्द्यजाः ॥

Ballâla Sena having observed this evil practice of the Râr̂hi class of Brâhmanas, selected some principal Kulins from amongst those who abstained from accepting the gift and invited them to his capital. When the Brâhmanas reached his place Ballâla, after careful examination, declared them to be spotless Kulins and honoured them. The names of those spotless Kulins are as follows: Bahurupa, S'ucha, Arabinda, *Halâyudha* and Bângâla of the Chatta family, Gobardhanâchârya of the Putitunda family, S'ira of the Ghoshâla family, Roshâkara of the Kundalâla family, Jâlhana, Maheśvara, Debala, Vâmana, Iśâna and Makaranda of the Bandya family, Utsaba and Garura of the Mukhaiti family, Kânu and Kutuhala of the Kanjilâla family.[1] It is probable that Ballâla honoured the above-named Kulins of the Râr̂hi class about the same time that he established the aristocracy (**कौलीन्य**) among the Bârendra Brâhmanas.

मासो दोकड़िनामा च रायौ च मधुसूदनः ।
कुशारिर्यैव नामा च हड़ोनारायणोऽपि च ॥
महिन्ताद्दिविधनामा दायारिश्चैव केशवः ।
चट्टशकुनिनामा च तैलवाटीनयारिकः ॥
कुन्दो विश्वेश्वरोज्ञेयो वन्द्यगोविठसंज्ञकः ।
घोषजौ भ्रातरावेतौ मदनविश्वरूपकौ ॥
गाङ्गुलो च हास्यनामा पूतिगौतमसंज्ञकः ।
सिम्लि पराशरः ख्यातः शङ्करो डिण्डिसायिकः ॥
अमी कुलोद्भवाश्चैव गोदानं जग्रहुर्द्विजाः ।
तेषां सम्बन्धमात्रेण पङ्के गौरिवसीदति ॥
सम्बन्धे भोजने चैव दाने यज्ञे तथैव च ।
विद्वद्भिः श्राद्धकाले च वर्ज्या एते पुनः पुनः ॥
इति कुलार्णवे ।
(यद्दृष्टं तल्लिखितम्)

[1] बहुरूपो शुचो नामा अरविन्दो हलायुधः ।
वाङ्गालश्च समाख्याताः पञ्चैते चट्टवंशजाः ॥
पूतिगोवर्द्धनाचार्य्यः शिरोघोषालसम्भवः ।
गाङ्गुली च शिशोनामा कुन्दोरोषाकरस्तथा ॥
जाल्हनाख्यस्तथावन्द्यो महेश्वर उदारधीः ।
देवलो वामनश्चैव ईशानो मकरन्दकः ॥
उत्साहगरुड़ौ ख्यातौ मुखवंशप्रतिष्ठितौ ।

Some time after this Ballâla died and his son Lakshmana Sena became the King of Bengal. During his reign he found that those 19 Kulins, who were declared by Ballâla Sena to be spotless, were quarrelling with one another in respect of their rank. None of them thought himself inferior to another, but everyone considered himself superior to another. This put a stop, as it were, to their matrimonial connection.

Lakshmana Sena, the son of Ballâla Sena and inheritor of his throne, having marked this disorder of the Society, which originated from malice, equalized the rank of those 19 Kulins who were previously honoured by Ballâla and who were quarrelling with one another for rank, *i.e.*, he declared them to be of the same status. In the time of this equalization Utsaba and Garura were both left out but were replaced by their children—Âita, Abhyâgata, Pundita and Bâdali. There were in all two equalizations among 21 Kulins. In the first, Âita, Bahurupa, S'ira, Gobordhana, S'iśa, Makaranda and Jâlhana, these seven Kulins were counted; and in the second, Arabinda *Halâyudha*, S'ucha, Bângâla, Debala, Maheśvara, Iśâna, Roshâkara, Bâdali, Vâmana, Pundita, Abhyâgata, Kânu and Kutuhala, these 14 Kulins were reckoned.[1] Ballâla did not make any rule in respect of secondary aristocrats (**गौन कुलीन**). They became apostate during the time of Lakshmana Sena, and consequently were expelled by him from the Kulin class.

In the beginning of this note I have stated that Halâyudha wrote Brâhmanasarbasva—an explanatory treatise of certain mantras of the Yajurveda. In its beginning he has identified himself in the following words: "In the lineage (**गोच**) of Vâtsya there was

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कानुकुतूहलावेतौ काञ्जिकुल समुद्भवौ ॥
ऊनविंशतिसंख्याताः समता लोकसम्मताः ।
एते सर्व्वे महात्मानः सभायां वल्लालस्य च ॥
राज्ञः प्रपूजिताः पूर्व्वं प्रतिग्रहपराङ्मुखाः ।
इति वाचस्पतिमिश्रकृतकुलरमायाम् ।

[1] आइतो बहुरूपाख्यः शिरो गोवर्द्धनः सुधीः ।
गां शिशोमकरन्दश्च जाल्हनाख्यः समा इमे ॥
इति प्रथमसमीकरणम् ।
अरविन्दो हलनामा शुचोवाङ्गालदेवलौ ।
महेश्वरस्तथेशानो रोषोवादलिवामनौ ॥
पण्डितोऽभ्यागतश्चैव कानुः कुतूहलस्तथा ।
समानाः कथिता एते लक्ष्मणेन प्रपूजिताः ॥
इति द्वितीयसमीकरणम् ।
मिश्रग्रन्थधृतवचनम् ।

a pre-eminent sacrificer called Dhananjaya having a wife by name Gochhâshandi. Halâyudha was the son of Gochhâshandi by Dhananjaya. In the prime of his age he (Halâyudha) was a Court pundita of Lakshmana Sena, in middle age he became Lord Chancellor and in old age he was the Prime Minister of the same King."[1]

From Halâyudha's own version we know that he never belonged to either S'ândilya or Kâśyapa lineage (**गोत्र**) as stated by Muktârâma and Lâlamohan respectively; but he belonged to the lineage of Vâtsya and his father's name was Dhanajaya. Halâyudha who was honoured by Ballâla was born in the Chatta family, and hence he belonged to the lineage of Kâśyapa and he was one of the equalized Kulins; and Halâyudha, who was born in the family of Batta Nârâyana, the ancestor of Bandya and hence Tagore family, belonged to the lineage of S'ândilya. His father's name was Râmarupa, and he cannot be found in the list of the equalized Kulins. For these reasons, we can safely say that Halâyudha, the author of Brâhmanasarbasva, and Prime Minister of Lakshmana Sena, son of Ballâla Sena, is a quite different person from Halâyudha, the ancestor of the Tagore family, and from Halâyudha of the Chatta family who was honoured by Ballâla Sena.

I am unable also to admit the statement made by Vidyânidhi, when he says that Lakshmana Sena or Lakshmana

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[1] वंशे वात्स्यमुनेर्मुनेरिव सदाचारस्य विश्रामभू-
र्धर्म्माध्यक्ष धनञ्जयः समजनिष्ठायां परं ज्योतिषः ।
यस्मिन् जुह्वति जातवेदसि हविर्व्योमाक्रमव्यापिभिः
धूमैर्धूपितमन्त्रसिन्धुसरितोवृन्दारकैः पीयते ।
गोच्छाषण्डीदैवतमक्षयमतिधैर्य्यसम्पदां वसतिः ।
प्रकृतिरिव परमपुंसस्तस्याभूद् यज्वनो गेहिनी ॥
बभूव तस्यां प्रकृतेर्महानिव श्रेयो निवासायतनं हलायुधः ।
यत्कीर्त्तिरम्भोनिधिवीचिदण्डदोलाधिरोहव्यसनं विभर्त्ति ॥
लब्धं जन्म धनञ्जयाद्भगवतः श्रीलक्ष्मणक्ष्मापते-
राकृत्यासदृशी निजस्य वयसः प्राप्ता महापात्रता ।

... .

बाल्ये ख्यापितराजपण्डितपदः श्वेतांशुविम्बोज्वल-
च्छत्रोत्सिक्तमहामहत्तकपदं दत्त्वा नवे यौवने
यस्मै यौवनशेषयोग्यमखिलं क्ष्मापालनारायणः
श्रीमान् लक्ष्मणसेनदेवनृपतिर्धर्म्माधिकारं ददौ ॥

हलायुधकृतब्राह्मणसर्व्वस्व ।

Nârâyana Sena, the son of Keśaba Sena, equalized the rank of the 19 Kulins honoured by his great-grandfather—Ballâla Sena, and that Halâyudha was his prime minister, inasmuch as we find in Halâyudha's own version that he was a Court pundit of Lakshmana Sena in the very prime of his age, while he became Lakshmana's Lord Chancellor in his middle age and in old age, the Prime Minister of the same King. It is stated also by Vidyânidhi that Halâyudha was honoured by Ballâla Sena. How then could Halâyudha be in the prime of his age during the time of Lakshmana Sena, the great-grandson of Ballâla? Moreover, it is quite impossible for the same 17 Kulins, who were honoured by Ballâla, to live up to the time of Lakshmana, his great-grandson, without a single of them being dead. It is really wonderful to observe that Vidyânidhi did not hesitate even to make Umâpatidhara a Court pundita of Lakshmana the great-grandson of Ballâla. This Umâpati was a Court pundita of Vijoy Sena, the father of Ballâla Sena. He composed the verses inscribed on a stone slab attached to the temple of Prōdyumneśvara S'iva established by Vijoy Sena. Vidyânidhi may try to support his view regarding Umâpati by citing the instance of Joyhari Chandra, a grandson of Mahârâjâ Krishna Chandra, who (Joyhari) was present in his time and is still present in the time of Mahârâjâ Kshitiśa Chandra, the 7th in descent from Krishna Chandra. But it is quite illogical to say that as Joyhari Chandra is living, so Umâpati lived, inasmuch as Joyhari's case is merely an exceptional one and cannot be made a general rule.

Under these circumstances we must hold that Halâyudha, the author of Brâhmanasarbasva, never belonged to either Kâsyapa (Chatta) or Sândilya (Bandya) lineage; but that he was of the lineage of Vâtsya, being the Prime Minister of Lakshmana Sena, the son and not great-grandson of Ballâla Sena,

This Halâyudha wrote several other books besides Brâhmanasarbasva, namely, Punditasarbasva, Nyâyasarbasva, S'ivasarbasva, Mimânsâsarbasva, etc. His elder brother Paśupati wrote a treatise on S'râddha and other ceremonials, known as Paśupatipaddhati. His younger brother wrote Ânhikapaddhati, a treatise on the daily duties of Brâhmanas. These books are still in existence but not very widely known.

5. *Pavana-dūtaṁ, or Wind-Messenger, by Dhoyīka, a court-poet of Lakṣmaṇasena, king of Bengal, with an Appendix on the Sena kings.*—*By* Monmohan Chakravarti, M.A., M.R.A.S.

Introduction. This poem was first brought to public notice by our Philological Secretary Mahāmahopādhyāya Paṇḍit Haraprasād Çāstrī in "Notices of Sanskrit MSS.," Second Series, vol. I, part II, pp. 221-2, (No. 225). A brief abstract of its contents was read by him in the Proceedings of this Society for July 1898, which was reproduced with some variations in his Preface to the above "Notices," pp. xxxvii-viii. He described the MS. as "a discovery of some importance," and rightly, for before this, no poem of Dhoyīka was known, and even up to now this MS. is the only copy known. Its owner Paṇḍit Raghurām Tarkaratna of Viṣṇupur, District Bānkuṛā, has, at the instance of its present subdivisional officer Babu Atal Behari Bose, kindly lent me the MS., and has thus enabled me to edit the text.

The MS. The MS., on yellowish country paper, consists of 12 leaves (or rather 23 pages), 13½″ × 3¾″. It was apparently part of a large MS., for the leaves are numbered on the left side from 151 to 162. The text, five or six lines to a page, is 10½″ × 11½″, and has besides marginal notes. The characters are modern Beṅgali; the handwriting neat and generally legible. The colophon states that the MS. was copied by one Rāmagati in Çaka 1752 *Kārttika sita*, or A.D. 1830, October-November, bright half (of the lunar month). Rāmagati is father of the present owner. In the text are various omissions and mistakes, some of which have been corrected in the margin apparently by the copyist himself. The marginal notes are few, and give no help in difficult or deficient passages. I have therefore given the text exactly as it stands in the MS., the conjectural emendations being noted in small brackets, and the omissions in larger brackets with asterisks. Several passages, however, still remain doubtful.

Contents. The poem has 104 stanzas, all in the metre *Mandākrāntā*. It was composed in imitation of Kālidāsa's lyric poem, *Megha-dūtaṁ*, cloud-messenger, (better known in the south as *Megha-sandeçaḥ*). The metre is the same; the story is an evident adaptation from the latter; and in several stanzas reminiscences and even actual words of the *Meghadūta* verses can be traced.

Imitations of Meghadutam. Such imitations of Kālidāsa's poem are not infrequent in later Sanskrit literature, as the following list will show:—

1. *Uddhava-dūtaṁ*, (vv. 141), by Mādhava Kavīndra Bhaṭṭācāryya of Tālitanagara (Printed in J. Vidyāsāgara's *Kāvya-saṁgraha*, Calcutta).

2. *Uddhava-dūtaṁ* or *U.-sandeçam*, (vv. 131), by Rūpa Gosvāmi, the disciple of Caitanya (printed in *K. saṁgraha*).
3. *Kīra-dutaṁ*, (vv. 238 ?), by Rāmagopāla, the court poet of a king of *Vaṅga* (MS. No. 67, "Notices" 2nd series, Vol. I).
4. *Cātaka-sandeçaḥ*, (vv. 141), by a Brāhmin of Keraḷa, (J.R.A.S., 1884, p. 451).
5. *Nemi-dūtaṁ*, (vv. 126), by Vikrama, a Jaina poem (*Kāvya-mālā*, Vol. II, Bombay).
6. *Padāṅka-dūtaṁ*, (vv. 146), by Mahāmahopādhyāya Kṛṣṇa Sārvabhauma in Çaka 1645 under the patronage of Mahārājādhirāj Rāmajīvana (Printed in *Kāvya-saṁgraha*).
   [Commentaries by Rādhāmohan and Rāmahari.]
7. *Pavana-dūtaṁ*, the present poem.
8. *Bhramara-sandeçaḥ*, (vv. 192), by Vāsudeva of Keraḷa (J.R.A.S., 1884, p. 452).
9. *Çuka-sandeçaḥ*, (vv. 163), by Lakṣmīdāsa of Keraḷa (Printed in J.R.A.S., 1884, pp. 404–431).
10. *Çuka-sandeçaḥ*, by Karingampalli Nambudrī (Oppert's List of MSS. 2721, 6426).
    [Commentary by Eralpatu, king of Calicut.]
11. *Çuka-sandeçaḥ*, by Raṅgācāryya (Rice's Mysore List of MSS., 244).
12. *Subhaga-sandeçaḥ*, (vv. 130), by Nārāyaṇa of Keraḷa (J.R.A.S. 1884, p. 449).
13. *Haṁsa-dūtaṁ*, (vv. 40), by Kavīndrācāryya Sarasvatī (Burnell's Catalogue of Tanjore Palace Library, p. 163*a*).
14. *Haṁsa-dūtaṁ*, (vv. 142), by Rūpa Gosvāmī (Printed in *Kāvya-saṁgraha*).
    [Commentaries by Nṛsiṁha, Rāmaçaṅkara and Viçvanātha Cakravarttī.]
15. *Haṁsa-sandeçaḥ*, (vv. 110), by Veṅkaṭeça Vedāntācāryya (J.R.A.S., 1884, p. 450).
    [Commentary by Appayya Dikṣita.]
16. *Haṁsa-sandeçaḥ*, (vv. 110), by an unknown poet, writing apparently in rivalry of Veṅkaṭeça, No. 15, (J.R. A.S. 1884, pp. 450-1).

Story.

The story of the poem is very simple. On the sandal-hills is a Gandharva town named *Kanaka-nagarī* (v. 1). There Kuvalayavatī, a fair Gandharva girl, saw King Lakṣmaṇa who had come on world-conquest. She fell in love with him (v. 2). But unable to express to him her feelings she passed several days in grief. Deeply distracted, she at length begged the southerly breeze (v. 3) to convey to the king of Gauḍa her message of love (v. 5). She then describes the countries and the people, the wind would have to pass over (vv. 8-35), until it would come to *Vijayapura* the capital of the king. The capital and the king are then described (vv. 36-60). Then the love message and the pangs of her sufferings the wind is asked to communicate to the king (vv. 61-100). The last four stanzas are personal or benedictive.

Geographical Details.

Interesting geographical details are furnished in the description of the wind's journey (vv. 8-36). The breeze starts from the *Malaya* (v. 8), the hill-range forming the eastern boundary of Travancore. Crossing the valleys at the foot of the *Malaya*, it will go to *Pāṇḍa-deça*, with its capital *Uraga-pura* or *Bhujaga-pura* (v. 10) on the bank of the *Tāmraparṇī* (v. 8). *Pāṇḍa-deça* or the country of the Pāṇḍyas is comprised in the modern Districts of Tinnevelly and Madurā with S. Travancore; Tinnevelly itself stands on the left bank of the river Tāmraparṇī. The *Pāṇḍyas* are known from very early times, being mentioned in the rock Edicts of Asoka, the Vārttikas of Kātyāyana, and also in Mahābhārata and Rāmāyaṇa. The capital *Uragapura* is mentioned in Raghuvaṁça, vi. 59-60; while the *Tāmraparni* with the pearl fishery at its mouth in the Gulf of Mannar is still more famous. The Greek and Roman name for Ceylon, Taprobane, is believed to be derived from this river's name.

Pāṇḍya-deça.

The wind will then pass by the Bridge of Rāma which looks like an arm of the earth extended to the *Laṅka-dvīpa* (v. 10); and here lies the god *Rāmeçvara* (v. 11). This refers, of course, to the Adam's Bridge and the well-known temple of Rāmeçvara, described to be one of the twelve *Jyotirliṅgas*.

Coḷas.

The wind next proceeds to *Kāñcipura*, the ornament of the South (v. 12), the capital of the *Coḷa* ladies (v. 14). *Kāñcī* or Conjeeveram is one of the oldest cities of India, being mentioned in Pātañjali's Mahābhāṣya; while the *Coḷa*s have been named in the rock Edicts of Asoka, and the Vārttikas of Kātyāyana. At the time the poet wrote, the *Coḷas* were the most powerful in the South, having been raised to that eminence by Kulottuṅga Cola I (A. D. 1070-1118.)

Keraḷas.

Following (westward) the course of the *Kāverī* (v. 115), the wind will come to the land of the *Keraḷas* (v. 16). The river *Kāverī*, which fertilises the *Coḷa* country, flows past the great temple of Çrīraṅgam. The *Keraḷa* land is identifiable with the west coast from N. Travancore to Gokarṇa in N. Mysore. *Keraḷa* was known to Pātañjali, and is apparently the same as *Keraḷa-putra* of Asoka's rock Edicts.

Mālyavan Mt.

Having thus gone through the southern half of Deccan, the wind will next see the *Mālyavanta* mountain (v. 18), and *Pañcāpsara* the tank of *Māsyakarṇi Ṛṣi* (v. 19). Both these names are well known from Rāmāyaṇa.[1] *Mālyavanta*[2] is apparently the central portion of the

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[1] Rāmāyana 3. 11. 11-12; Raghuvaṁça, 13. 38.

[2] For *Mālyavanta*, see Rāmāyaṇa 4. 28. 1. The difference between poetical talent and poetical genius can be well seen by comparing the

Eastern Ghāṭs between the rivers Pennār and Kṛṣṇā; and the *Pañcāpsara* tank is to be located somewhere between the Kṛṣṇā and the Godāvarī.

Kaliṅga-nagarī.

Then the wind avoiding the passes round about the *Godāvarī* will turn to the capital of *Kāliṅgas*, (v. 21); from which it will go to the sea-coast (v. 22). It is clear that the Kaliṅga capital was near the sea but not on the coast. In the 12th century this capital was at *Kaliṅga-nagara*, which has been reasonably identified with modern Mukhaliṅgam[1] in Pārḷā-Kimiḍi Tributary State, District Gañjām. This town stands on the river Vaṁçadhara, 18° 37′lat. 84.° 3′ long., about 22 miles by map from Kaliṅgapattam, the port at the mouth of this river.

Vindhya Mountains.

From the sea-coast the wind will blow over the *Vindhya-pādāḥ*, frequented by elephants (v. 23), to the *Revā* with its groves peopled by *Savarīs* and its plains by more civilised races. The hill ranges to the north of the Mahendra Mountain were considered to be a part of the Vindhya; and this hilly region was then occupied by the *Savara* tribes. The wind thus cuts direct north and reaches the source of the river *Revā* or Narmmadā in the Amarakanṭaka hill.

Yayāti-nagarī.

The wind is then asked to go to *Yayāti-nagarī* to see the amorous frolics of *Keraḷī* girls (v. 26). This town has not yet been identified, but it is mentioned in a copperplate inscription of Mahā-çiva-gupta.[2] There it is said to be on the bank of the *Mahānadī*, which may, after all, be a common name referring to some large river. Anyhow it was in the country of Dakṣiṇa-Kosala, identifiable with the eastern part of Central Provinces. Curiously enough the people are called *Keraḷas*.

From *Yayāti-nagarī*, the wind will blow on to the *Suhma-deça* on the Ganges (v. 27). Here the Brāhman ladies wear tender palm leaves as ear-ornaments (v. 27); and here the god Murāri resides (v. 28). On the bank of the Ganges is (an image of) Çiva and Pārvatī combined (v. 30). Further up comes the separation of the Bhāgirathi and the Jamunā rivers (v. 33); and place is reached the capital *Vijayapura* on the bank of the Ganfinally 36).

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description of *Mālyavanta* in v. 18 of *Pavanadūtaṁ* with Raghu 13. 26 and Uttara-rāmacarita, 1. 33.

> एतद्गिरेर्माल्यवतः पुरस्तात् आविर्भवत्यम्बरलेखिशृङ्गं ।
> नवं पयो यत्र घनैर्मया च त्वद्विप्रयोगाश्रु समं विसृष्टं ॥ रघुवंश ।
> सोऽयं शैलः ककुभ-सुरभिर्माल्यवान् नाम यस्मिन् ।
> नीलस्निग्धः श्रयति शिखरं नूतनस्तोयवाहः ॥ उ० चरित ।

[1] Ep. Ind. IV, pp. 188-9.

[2] Ep. Ind. Vol. III, p. 356.

Suhma.

Suhma is the old name of a Division of Bengal comprising northern Midnapore, District Hughly west of the Sarasvatī river and the eastern part of District Burdwan. *Tāmralipti* was its port,[1] and *Vijayapura* its capital. *Vijayapura* is apparently to be identified with Nūdīah (Nadiā or Navadvīp), which was the capital of Lakhaniya at the time of the inroad of Muḥammad-i-Bakht-yār.[2] Is this name connected in any way with Vijäyasena, grandfather of Lakṣmaṇasena ?

The time of the poet.

The poet Dhoyīka (or Dhoyī Kavirāja as per colophon) can have his time ascertained only approximately. Being mentioned in *Gīta-govinda*, verse 4, he must be a contemporary of or slightly older than Jayadeva. But Jayadeva's time has not yet been definitely ascertained. Dhoyīka's verse is quoted in Jalhana's *Subhāṣita-muktāvalī*, compiled in the second half of the 13th century[3] and in Çrīdharadāsa's *Sadūkti-karṇāmṛta* compiled in A.D. 1205-6.[4] So he must be earlier than 1205. He cannot be much earlier, for in the present poem he makes Lakṣmaṇa of the Sena dynasty its hero.

The chronology of the Sena dynasty in Bengal is involved in much confusion. It is therefore discussed at length in an Appendix. I have therein come to the conclusion that Lakṣmaṇasena ruled from A.D. 1170-1 to about 1200. He must have ruled for some time, before he could be mentioned as having gone out on world-conquest (v. 2). Consequently the composition of the poem may be reasonably inferred to have taken place in the fourth quarter of the 12th century.

The text with an index of çloka-beginnings and of proper names, chiefly geographical, is appended.

APPENDIX.

The Sena Dynasty of Bengal.

The Sena Dynasty.

The chronology of this dynasty was, up to a recent period, largely based on traditions given in the *Kula-pañjikās* of *ghaṭaks* (matchmakers), and in such works as *Kṣitīça-vaṁçāvalī-caritaṁ* and Āin-i-Akbari. Recent researches are, however, clearing the ground. As the author of *Pavana-dūtaṁ*, Dhoyīka, was the court poet of Lakṣmaṇasena, it has become necessary to ascertain the approximate time of this king, and thus indirectly of the whole dynasty.

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[1] *Daçakumāra-carite* 6th *uccahāsa* " *Suhmeṣu Dāmalipt-āhvayasya.*"

[2] Raverty's translation, p. 554.

[3] Notices of Bombay Sanskrit Mss., 1897, p. XXVI (*Goi-dhoi Kavirāja*).

[4] R. L. Mittra's Notices of Sanskrit Mss , Vol. III, pp. 135, 145.

Documents for determining their Succession.

From the following documents the succession of the Sena kings has been well established:—

(*a*) The *Vallāla-caritaṁ* of Ānanda Bhaṭṭa (Biblotheca Indica edition) p. 61; Adhyāya 12, çlokas 50-3;

(*b*) The MSS. of *Dāna-sāgara* and *Adbhuta-sāgara* attributed to Ballālasena (their introductory verses);[1]

(*c*) The stone inscription of Vijayasena at Deopārā (Ep. Ind. I., pp. 307-8).

(*d*) The copperplate inscriptions.

- (i) Tarpaṇadighi, of Lakṣmaṇasenadeva (J.A.S.B., XLIV, p. 11).
- (ii) Bākargañj, of Viçvarūpasenadeva (J.A.S.B., VII, p. 43).
- (iii) Madanapāḍa; of Viçvarūpasenadeva (J. A.S.B., LXV, p. 9.)

Their Succession.

These show that the dynasty was founded by Sāmantasena; then his son Hemantasena who married Yasodevī; then his son Vijayasena; then his son Vallālasena; then his son Lakṣmanasena who married Çrī-tāndrā (?); and lastly his son Viçvarūpasena.

The succession thus proved disposes of the assumption of Dr. R. L. Mittra that two Lakṣmaṇasenas existed in the Sena dynasty.[2] It also sets aside the traditionary list in the Āin-i-Akbari[3].

Their Chronology.

The next question is about the times of the Sena kings. The determination of these times largely depends upon the ascertainment of Lakṣmaṇasena's rule. For the beginning of Lakṣmaṇasena's rule various dates have been given A.D. 1106,[4] 1119-20,[5] 1170,[6] and 1172.[7] On account of conflicting data, the solution of the problem is not free from doubts.

Laksmansena Era.

The first historical fact to be noted is an era, known as Lakṣmaṇsena's samvat, abbreviated to ल॰ स॰. This era is still used in Mithilā, and according to some modern calculations it began in A.D. 1106. But calculating from six of the earliest dates (five in MSS. and one in inscription), Prof. Kielhorn arrived at the conclusion that the era really began in A.D. 1119-20. According to him the La° Sa° was an ordinary southern (*Kārttikādi*) year with the amānta scheme of lunar fortnight; and the first day of the era was *Kārttika sudi* one of the expired çaka year 1041 = 7th October A.D. 1119.[1] I think this is a right conclusion, *particularly as it is supported by* a statement in the Akbarnāma[2] and other evidences.

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[1] Of the *Dāna-sāgara*, extracts from three MSS. are available (R. L. Mittra, Notices of Sanskrit MSS. I, p. 151; Eggelling, India office MSS. Catalogue, p. 545; and "Notices," 2nd Series by Haraprasād Çātrī, Vol. I, p. 170). Of the *Adbhuta-sāgara* extract from one MS. is known, Report on Sanskrit MSS., Dr. R. G. Bhaṇḍārkar, 1897, pp. 83—85.

[2] J.A.S.B., XLVII, pp. 398, 402.

[3] Jarrett's Transl. Vol. II, p. 146.

[4] J.A.S.B. XLVII, p. 398; *Vallāla-caritaṁ*, Adh. 27, çl. 4, p. 121.

[5] Epig. Ind. Vol. I, p. 306; J.A.S.B., LXIX, p. 62.

[6] J.A.S.B., LXV, p. 31.

[7] Report on Sanskrit MSS. in Bombay, 1897, p. LXXXVIII

The era taken to begin from his first year.

Objections.

The era is generally taken to begin from the first year of Lakṣmaṇasena's reign which, according to an anecdote in the Ṭabaḳāt-i-Nāṣirī,[3] began with his birth. But this view is open to serious objections. Firstly, it involves the assumption of a rule of more than eighty years—a fact unprecedented in Indian history and I suppose in the recorded history of the world too, even if the rule began from his birth. Moreover, in the *Adbhuta-sāgara* Ballālasena is described to have raised his son to the throne before his own death.[4] If so, Lakṣmaṇasena must have been of same age at the time of accession; and his reign for more than eighty years becomes still less credible. Secondly, in the MSS., the *Dāna-sāgara* is said to have been composed by Vallālasena in Çaka year *Caçi-nava-daça* (1091); while the *Adhbuta-sāgara* is said to have been begun by Ballālasena in the Çaka year *Kha-nava-kh-end-vābde* (1090).[5] These show that Ballālasena was reigning in Çaka 1090 and 1091 (A.D. 1168-69 and 1169-70), which is incompatible with the assumption of Lakṣmaṇasena's rule beginning in A.D. 1119-20. The MS. of *Adbhuta-sāgara* distinctly says that though begun by Ballālasena, it was completed by his son Lakṣmaṇasena, whom he (Ballāla) raised to the throne before his death. If this be true, Lakṣmaṇasena could not, possibly, have been king before A.D. 1168-69. Thirdly, it is curious to find that not a single date in the Lakṣmaṇasena era has yet been found earlier than 51, *i.e.*, earlier than A.D. 1170-1.[6]

The wording of the two inscriptions in this era.

The two known inscriptions of this era are peculiarly worded, and run as follows:—

(1) *Çrīmal-Lakṣmaṇsenasy-ātīta-rājye saṁ* 51 *Bhādra-dine* 29.[7]

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[1] Ind. Ant., XIX (1890), p. 6.; Ep. Ind. I, p. 306, note 6.

[2] “ For example, in Bengal, the era dates from the beginning of the rule of Lachman Sen, from which date till now 465 years have elapsed;” Akbarnāma, Beveridge's transl., vol. II, pp. 21-2. 465 La. Sa. = 1506 Çaka = 1641 V. Saṁvat.

[3] Major Raverty's Translation, p. 555.

[4] Notices of Bombay MSS., 1897, pp. LXXXV-VI.

[5] Catalogue of India Office MSS., p. 545; and Bom. MSS., 1897, p. LXXXVI.

[6] Jour. Bom. Br. R.A.S., XVI, p. 358.

[7] Jour. Bom. Br. R.A.S., XVI, p. 358.

(2) *Çrīmal-Lakṣmaṇasena-devapādām-atīta-rājye saṁ* 74 *Vaiçākha-vadi* 12 *Gurau.*[1]

Literally, these would mean—" years 51 or 74 expired of Laksmaṇasena's reign," *i.e.*, his regnal years. But may not the years *really* refer to that of a general era which fell in that king's reign? Several such instances are known in Indian epigraphy, *e.g.*—

(1) In the Junāgaṛh inscription of Rudradāman—
l. 4—" *Rudradāmno varshe dvi-saptatitame* 70 2."[2]

(2) In the Gaṛhvā inscription of Candragupta II—
l. 10—" *Çrī-Candragupta-rājya saṁvvatsare* 80 8.[3]"

(3) Bilsāṛ inscription of Dhruvaçarman—
l. 6—" *Çrī-Kumāraguptasy-ābhivarddhamāna-vijaya-rājya-saṁvatsare shaṇ-ṇavate.*"[4]

(4) Gaṛhvā inscription of Kumāragupta I—
l. 2—" *Çrī-Kumāragupta-rājya-saṁvatsare* 90 8. "[5]

(5) Kosam inscription of Bhīmavarman—
l. 1—" *Mahārājasya Çri-Bhīmavarmaṇah saṁvat* 100 30 9."[6]

(6) Halsī plates of Kākusthavarman—
l. 4—" *Sva-vāijayike açītitame samvatsare.*"[7]

In (1) the year is referred to Çaka era and in (2) to (5) the years to Gupta era; they are not considered to be regnal years.

The era is from the founder's first year.

More facts are needed to arrive at a reliable conclusion. On the existing data the safest theory at present is to take the first year of the era as the first year of the dynastic founder, and to believe that on the accession of Lakṣmaṇasena, the era was either formally adopted or made so widely prevalent that the era came to be known as Lakṣmaṇasena's. This theory meets the objections above raised on the ground of length of years or the dates of compilation of the *Dāna-sāgara* and the *Adbhuta-sāgara*. It also helps to explain the following additional facts:—

In the Deopārā inscription, v. 20, Vijayasena is described to have assailed the lord of Gauda, to have put down the prince of Kāmarūpa and defeated the Kaliṅga. In the succeeding verse, 21, are named Nānya, Rāghava, Vardhana and Vīra, as (kings) who were kept in prison.[1] Presumably these names include the names of the defeated kings. Who was the defeated king of Kaliṅga? Is he Rāghava? Such was undoubtedly the name of a Kaliṅga king who ruled between A.D. 1156-1171.[2] The early years of Rāghava (A.D. 1156-60) would fit in with the last years of Vijayasena, if the above view be adopted.

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[1] Ind. Ant. X, p. 346.
[2] Ep. Ind., VIII., p. 41 and note 6.
[3] Fleet's Gupta Inscriptions, p. 37.
[4] ,, ,, ,, p. 43.
[5] ,, ,, ,, p. 41.
[6] ,, ,, ,, p. 267.
[7] Ind. Ant. VI, p. 23.

According to Ṭabakāt-i-Nāṣirī,[3] the news of the victories of Muḥammad-i-Bakht-yār and of his conquest of Bihār reached the ears of Rāe Lakhmaṇiah, when he had been on the throne for a period of eighty years; and the following year he invaded the Rāe's capital Nūdīah and sacked it. Now, a rule of eighty years and more is not in itself credible, as I have already pointed out. But if the year be taken as Saṁvat 80 of the era during the reign of Lakṣmaṇasena, as Professor Kielhorn pointed out,[4] the incredibility disappears. This would make the inroad and the sack of Nūdīah fall in Saṁvat 81 or A.D. 1199-1200. This date very nearly agrees with the date arrived at from Mussulman histories by Dr. Blochmann, as A.H. 594 or A.D. 1198.[5]

No doubt Major Raverty held the date of inroad as A.H. 590 or A.D. 1194,[6] because Muḥammad-i-Bakht-yār who died in A.H. 602 is said to have reigned 12 years. But this does not necessarily mean 12 years after his sacking of Nūdīah; it may as likely refer to the time of his first charge, when holding the fief of Kashmandī (or Bhugwat and Bhiūlī).[7] On the other hand, Dihli was occupied in A.H. 589, and Dr. Blochmann shewed that after this occupation various events occurred with respect to Muḥammad-i-Bakht-yār which would have taken several years. "It would, indeed, be a close computation if we allowed but five years for the above events, *i.e.*, if we fixed the conquest of Bengal as having taken place in 594 H., or A.D. 1198."[8]

Lakṣmaṇasena's reign came to an end shortly after Muḥammad-i-Bakht-yār's inroad.[9] From the introduction to *Saduktikarṇāmṛta*, it does not appear that Çrīdharadāsa was *Mahāmaṇḍalika* under Lakṣmaṇasena, though he says his father had served him.[10] Evidently therefore this king did not live at the time of composing that work in A.D. 1205-6. 1200 A.D. might accordingly be taken as the approximate termination of Lakṣmaṇasena's rule.

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[1] Ep. Ind. I, p. 309, lines 19-20.
[2] J. As. Soc. Beng., LXXII, p. 113.
[3] Transl. pp 554, 555, 557.
[4] Ind. Ant., XIX, p. 7.
[5] J.A.S.B., XLV, p. 276.
[6] Tab. Nāṣ transl., note 4 below p. 559, note 8 below p. 573.
[7] ,, pp. 549-550.
[8] J.A.S.B., XLV, p. 276.
[9] Transl., p. 558.
[10] R. L. Mittra, Notices of Sanskrit MSS., III, p. 141.

Chronology of the Sena Kings.

To summarise, the chronology of the Sena kings would then stand as follows :—

Sāmantasena, founder (A.D. 1119-20)
|
His son
Hemantasena = Yasodevī
|
His son.
Vijayasena, contemporary of Rāghava (also of Coṛagaṅga)[1]
(1140—1158-60 ?)
|
His son
Ballālasena (1158-60—1170)
|
His son
Lakṣmaṇasena (1170-1200 *Circa*) = Çrī-tāndrā (?)
Saṁ 51, 74, 80, 81.
Inroad of Muḥammad-i-Bakht-yār (A.D.1199 *Circa*)
|
His son
Viçvarūpasena.

It is noted in the Ṭabaḳāt-i-Nāṣirī : "His [Lakhmaniah's] descendants, up to this time, are rulers in the country of Bang."[2] By "up to this time," I suppose, is meant either the years in which the author was in Bengal, A.H., 641-2 (A.D. 1244-5) or the year in which it was finished A.H. 658 (A.D. 1260).

Their caste.

Some discussion took place in the time of Dr. Rājendralāl Mittra as to the caste of the Sena kings. In the Deopārā inscription of Vijayasena, Sāmantasena is described as "*Brahma-Kṣatriy-āṇāṁ kula-çiro-dāma.*"[3] The same term *Brahma-Kṣatra* is used in the *Vallála-caritaṁ* for these kings.[4]

What does *Brahma-Kṣatra* mean ? Prof. Kielhorn translated the above passage "head-garland of the clans of Brāhmaṇas and Kṣatriyas.[5]" *In Çuka-sandeça* v. 34, *Kerala* land is described as "*Brahma-ksatraṁ janapadaṁ* ;" and in note 11, the word is taken to mean "Brāhman-kinged.[6]" Were the Sena kings then Brāhmaṇised Kṣattriyas ? In the inscriptions they are said to be of lunar race.

Their origin.

Did the founder come from the south ? In the Deopārā inscription it is said that in the lunar race arose Dākṣiṇātya rulers, Vīrasena and the rest (v. 4) ; that in that Sena family was born Sāmantasena (v. 5) who singly killed the robbers of Karṇāṭa (v. 8), and who in his old age frequented the hermitages on the banks of the Ganges

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[1] *Vallāla-caritaṁ*, Adh. 12, v. 52, p. 61.
[2] Transl., p. 558.
[3] Ep. Ind., I, p. 306.
[4] Adhyāya 12, v. 54, p. 61 ; cf. v. 45.
[5] Ep. Ind., I, p. 312.
[6] J.R.A.S., 1884, p. 409 ; for note 11, pp. 433-4.

(v. 9) ; and that from him was born Hemantasena (v. 10). With this may be compared Dhoyīka's selection of the southerly breeze, and his high eulogy of the *Cola*-land as the ornament of the south. Is it likely that Sāmantasena is connected with Coṛagaṅga of Kaliṅga ? Çoṛagaṇga conquered and apparently killed the Mandāra king on the bank of the Ganges (Maṅdāra seems identifiable with Suhma), after he had conquered Utkala[1] ; and Utkala must have been conquered by him several years before Çaka 1040 (A D. 1118-9), an inscription of which year describes him as "*sakal-Otkala-sāmrājya-padavī-virājmānaiṁ.*"[2] Is it therefore possible to infer that Coṛagaṅga, after killing the king of Suhma, put Sāmantasena in charge as feudatory ?

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[1] J.A.S.B., 1895, p. 139, note 1 ; Do. 1896, p. 241 ; cf. also J.A.S.B. 1903. p. 110.

[2] Ind. Ant. XVIII, p. 169.

INDEX OF PROPER NAMES.

[*The numeral figures refer to the number of verses.*]

Uraga-pura, a town,—8, cf. 10.
Kanaka-nagara, Gandharva town—1.
Kavi-narapati,—103 (cf. colophon).
Kavi-Kṣmābhṛtāṁ Cakravarttī, (title) —101.
Kāñcī, town—12, 15.
Kāliṅga-nagara, town—21.
Kāverī, river—15.
Kuvalayavatī, the heroine,— 2, 62.
Keraḷi, nation—16, 26.
Gaṅgā, river—16, 27, 32, 39, 102, cf. 33.
Godāvarīka, residents of river Godāvarī—21.
Gauda-deça, country—6.
Gauḍa-rāja—96.
Gauḍa-Ksauṇī king of Gawda—5.
Gauḍ-endra king of Gauda—101.
Candan-ādri, Malaya hill range—1.
Coḷa, nation—14.
Tapana-tanayā, river Jamunā—33.
Tāmraparṇī, river—8.
Dākṣinātya, tract—17, 63.
Deva-rājya, country—28.
Dhoyīka, poet—101.
Dhoyī-Kavirāja, poet (with title)—colophon.
Pañcapsara, tank—19.
Pāṇḍa-deça, country—8.
Bhāgīrathi, river—33.
Bhujaga-pura, town—10.
Malaya, a hill range—
Malaya-kaṭaka—63.
Malaya-kṣmādhara, —5, cf. 1.
Malayaja-rajaḥ—71.
Malaya-pavana—3, 85.
Malaya-maruta—9, 92.
Malaya-opatyakā—62, 88.
Māsyakarṇī, saint,—19.
Mālyavanta, hill range—18.
Yayāti-nagarī, town—26.
Rāmeçvara, god and place—11.
Revā, river Ñarmmadā—25.
Laṅkā-dvīpa, Ceylon Island—10.
Lakṣmaṇa, the king and hero—2.
Lopāmudrā, wife of Agastya Ṛṣī—44.
Vindhya, a range of hills—23, 24.
Vijayapura, capital—36.
Çavarī, tribe—25.
Çrī-khaṇḍ-ádri, hill—8, 62.
Sena-ānvaya, the Sena dynasty—28.
Suhma, country—27.
Sva-rnadi, river Ganges—30.

पवन-दूतः(*) ।

श्रीरामाय नमः ॥

अस्ति श्रीमत्यखिलवसुधासुन्दरे चन्दनाद्रौ
गन्धर्व्वाणां कनकनगरी नाम रम्यो निवासः ।
हैमैर्लीलाभवनशिखरैरम्बरं व्यालिखद्भि-
र्धत्ते शाखानगरगणनां यः सुराणां पुरस्य ॥ १ ॥
तस्मिन्नेका कुवलयवती नाम गन्धर्व्वकन्या
मन्ये जैत्रं मृदु कुसुमतोऽप्यायुधं या स्मरस्य ।
दृष्ट्वा देवं भुवनविजये लक्ष्मणं क्षौणिपालं
वाला सद्यः कुसुमधनुषः संविधेयीवभूव ॥ २ ॥
वाल्यादालीष्वपि मनसिजं सानभिव्यञ्जयन्ती
पाण्डुक्षामा कतिचिदनयत् कातरा वासराणि ।
गन्तुं देशान्तरमथमधावन्यथैव प्रवृत्तं
गाढोत्कण्ठा मलयपवनं सप्रणामं ययाचे ॥ ३ ॥
त्वत्तः प्राणाः सकलजगतां दक्षिणस्त्वं प्रकृत्या
जङ्घानं(लं) त्वां पवन मनसोऽनन्तरं व्याहरन्ति ।
तस्मादेव त्वयि खलु मया संप्रणीतोऽर्थिभावः
प्रायो भिक्षा भवति विफला नैव युष्मद्विधेषु ॥ ४ ॥ (Fol. 1^{b})
वीक्षा(क्ष्या)वस्थां विरहविधुरां रामचन्द्रस्य हेतो-
र्यातः पारं पवन सरितां पत्युरप्याञ्जनेयः ।
तत्तातस्याप्रतिहतगतेर्यास्यतस्ते मदर्थं
गौडक्षौणी कति नु मलयक्ष्माधराद्योजनानि ॥ ५ ॥
तत्रावश्यं कुसुमसमये स त्वया शीलनीयः
सान्द्रोद्यानस्थगितगगनप्राङ्गणो गौडदेशः ।

तन्मे (ऽ*)वश्यां कथय नृपतेर्जौ(र्ज्जौ)वनत्राणहेतोः
प्रादुर्भावस्त्रिजगति खलु त्वादृशानां परार्थः ॥ ६ ॥
हृत्वानर्घ्यं परिमलमितश्चन्दनानोहका(कहा)नां
तूर्णं तावद्दिक्जमलयोपत्यकाकाननानि ।
यावन्नैते निधुवनकलाकेलिभाजो भुजङ्गा
भोगव्याजाच्चुलुकचुल(लु)कं मत्सरात्त्वां पिवन्ति ॥ ७ ॥
श्रीखण्डाद्रेः परिसरमतिक्रम्य गव्यूतिमात्रं
गन्तव्यस्ते किमपि जगतीमण्डनं पाण्ड्यदेशः ।
तत्र ख्यातं पुरमुरगमित्याख्यया ताम्रपर्णी-
स्तीरे मुग्धक्रमुकतरुभिर्व्वद्धरेखैर्भजेथाः ॥ ८ ॥
सम्भोगान्ते श्लथभुजलतानिःसहानां वधूनां (Fol. 2^a)
व्याधुन्वन्तो(ऽ*)नुचितकवरी-भारमव्याजमुग्धं ।
अस्मिन् सद्यः श्रमजलनुदः सौधजालैरुपेत्य
प्रत्यासन्ना मलयमरुतस्तालवृन्तीभवन्ति ॥ ९ ॥
क्रीडाशैलं भुजगनगरीयोषितां कौतुकश्चेत्
सेतुं याया जलधिकिरणः शृङ्खलादामदीर्घं ।
भाति स्नेहादवनितल(न)याजीवनाश्वासहेतो-
र्लङ्काद्वीपं प्रहित इव यो वाहुरेकः पृथिव्याः ॥ १० ॥
क्रुध्यद्गौरी(कर*)किश(स)लयाकृष्टचूडासुधांशो-
र्द्र(र्द्रै)व्यस्यूच्चैः फल(पद ?)मकलुषं तत्र रामेश्वरस्य ।
मे(म)ध्यं यत्र त्रिवलिविषमं वारसीमन्तिनीनां
हस्तोत्कम्पं कथयति विधेः स्पष्टकाञ्चीपदस्य ॥ ११ ॥
लीलागै(गा)रैरमरनगरस्यापि गर्व्वं हरन्तीं
गच्छेः काञ्चीपुरमथ दिशो भूषणं दक्षिणस्याः ।
नक्तं यत्र प्रहरिक इवोज्जागरं नागराणां
कुर्व्वन् प्रा(पा)णिप्रणिह(हि)तधनुर्ज्जायते पञ्चवाणः ॥ १२ ॥
आल्म्बी(ल्म्बं ?)लि(ली)लाविहसितमिव श्यावतामभ्युपेता

सद्यः फेणव्यतिकरमिषादर्पयत्यं शुकान्तं ।
अम्भःक्रीड़ाकुतुकर (Fol. 2^b) भसम्भ्रष्टचीनोत्तरीये
यन्नारीणामुरसि सुबला वीचिहस्तैः सखीव ॥ १३ ॥
मन्ये मोक्षः कठिनसुरतायासलब्धस्य तूर्णं
दुष्पा(ष्प्रा)पस्ते पवन भविता चोलसीमन्तिनीभ्यः (।*)
के वा तासामलकरचनाली(नी)ललीलासनाथे
गण्डाभोगे मलयजपयः पिच्छिले न स्खलन्ति ॥ १४ ॥
हित्वा कि(का)ञ्चीमविल(न)यवतीभुक्तरोधोनिकुञ्जां
तां कावेरीमनुसर खगश्रेणिवाचालकूलां ।
कान्ताश्लेषादपि खलु सुखस्पर्शमिन्दुत्विषोऽपि
स्वच्छं भिन्दाप्रवल(ण)मनसो(ऽ*)प्यम्बु यस्या लघीयः ॥ १५ ॥
या गङ्गेव प्रकृतिसुभगा जायते केरलीनां
केलिस्नाने कुचमलयजैः पाण्डिमानं दधाना ।
श्व(भ्र)श्यद्गोत्रस्खलनजनितत्रासलोलस्य सिन्धो-
रुद्वीचिभ्रूस्फुरणपतनप्रेमवाचां रसज्ञा ॥ १६ ॥
तस्या लीलासरित इव ताः स्रोतसि श्रोणिदाघ्ना
तोय(: *) क्रीडां यदि विदधते दाक्षिणात्यास्तरुण्यः ।
वीचिक्षेपैः स्तनपरिसरेष्वस्तहारेषु तासां
मुक्ताजालं रचय तदपां विन्दुभिः कुन्दगौरैः ॥ १७ ॥
स्नि(Fol. 3^a)ग्धा(ग्ध)श्यामं गुरुभिरुपलैः पर्व्वतं माल्यवन्तं
पश्येरुत(त्त)म्भितमिव पुरः केशपाशं पृथिव्याः ।
तत्राद्यापि प्रतिस(भ ?)रजलैर्जर्ज्जराः प्रस्थभागाः
सीताभर्त्तुः पृथुतरशुचः सूचयन्त्यश्रुपातान् ॥ १८ ॥
रम्योपान्तं सरलतरुभिर्मास्यकर्णैः सरस्तद्रु-
च्छैः पश्चात्पुर इति हृतप्रौढ़तापं मघोनः ।
यत्राद्यापि त्रिदशतरुणीमुग्धसङ्गीतिमालाः
पूर्व्वप्रेमोपगतहरिणश्रेणिमुत्कण्ठयन्ति ॥ १९ ॥

क्रीड़ाशोकक्रमुकवकुलारामरम्योपकण्ठाः
संपत्स्यन्ते पथि पथि तव प्रीतये प्रस्थितस्य ।
पीनोत्तुङ्गस्तनभरनमत्पामरीप्रेमलोभा-
न्निर्व्विच्छेदभ्रमितपथिकाः पल्लयः पल्लविन्यः ॥ २० ॥
रन्ध्रान् हित्वा जलनिवि(धि)ड(d)पवधूगाङ्गोदावरीकान्
कालिङ्गस्यानुसर नगरीं नाम तां राजधानीं ।
संभोगान्ते मुकुलितद(दृ)शां तत्र वाराङ्गनाना-
मङ्गग्लानिं हर परिपतन् केलिवातायनेषु ॥ २१ ॥
लेख(खेल)द्वीचिप्रचयरचितानेकसोपानरेखं
तीरं यायाः फल(Fol. 3^b)भरनमत्पूगमालं पयोधेः ।
गायन्तीनां श्रवणसुभगं तत्र सिद्धाङ्गनानां
स्थाने स्थाने जनय शनकैस्तानशब्दानुवादान् ॥ २२ ॥
कुञ्जक्रीड़ात्रिदशतरुणीकेलिनिश्वासवाते-
र्म्मा(र्म्ला)यद्वल्लीकिश(स)लयरुचो निर्व्विशेर्व्विन्ध्यपाला(दा)न् ।
पश्यन् वक्त्रान्यनतिचतुरवारसीमन्तिनीनां
माद्यद्गन्धद्विरदरसितत्रासला(लो)लेक्षणानि ॥ २३ ॥
स्वेच्छारम्यं विहर विहगव्याकुलत्तुङ्गवृक्षे
विन्ध्योत्सङ्गप्रणयिनि वने मानवत्यो(ऽ*)पि यत्र ।
संजायन्ते रहसि करिणां कु(क्रू)रमाकर्ण्य शब्दं
भर्त्तुः (कण्ठ*)प्रणिहितभुजावल्लयो भिन्नयोषाः ॥ २४ ॥
स्वैरक्रीड़ारसिकशवरीसिक्तरोधोनिकुञ्जं
गच्छेरेवामभिनवशुकश्यामवंशीवलेन ।
मन्यन्ते यत्परिसरभुवि प्रौढ़सीमन्तिनीनां
लीलामानग्रहमपि रतेरन्तरायं युवानः ॥ २५ ॥
लीलां नेतुं नयनपदवीं केरलीनां रतेश्चेत्
गच्छेः ख्यातां जगति नगरीमाख्यया तां ययातेः ।
गाढ़ाश्रि(श्लि)ष्टक्रमुकतरवः प्राङ्गणे नागवल्लयोः(ल्ल्यः)

बालां यत्र प्रियतमपरीरम्भमध्यापयन्ति ॥ २६ ॥
गङ्गावीचिप्लुतपरिसरः सौधमालावतं(Fol. 4^a)सो-
वास्यत्युच्चैस्त्वयि रसमयो विस्मयं सुह्मदेशः ।
श्रोत्रक्रीड़ाभरणपदवीं भूमिदेवाङ्गनानां
तालीपत्रं नवशशिकलाकोमलं यत्र याति ॥ २७ ॥
तस्मिन् सेनान्वयनृपतिना देवराज्याभिषिक्तो
देवः सु(सा)क्षाद्वसति कमलाकेलिकारो मुरारिः ।
पाणौ लीलाकमलमश्र(स)ह्यत्-समीपे वहन्त्यो
लक्ष्मीशङ्कां प्रकृतिसुभगाः कुर्व्वते वाररामाः ॥ २८ ॥
यातस्यो(स्रो)र्द्धं धनपतिनगेनैव गौ(सौ)धैरगारैः
पश्येस्तस्मिन्नगरमनघं चारुचन्द्रार्द्धमो(मौ)लेः ।
यत्रानेकप्रियसख (d) नखपदव्याजतोवाररामाः
भर्त्तुर्भूषाशशधरकलाचिह्नमङ्के वहन्ति ॥ २९ ॥
तत्रानर्घ्यं रघुकुलगुरुं स्वर्ग(र्ण)दीतीरदेशे
नत्वा देवं व्रज गिरिसुतासंविभक्ताङ्गरम्यं ।
याते यस्मिन्नयनपदवीं सुन्दरभ्रूलतानां
प्रौढ़स्त्रीणां गलति म(d)र(म)णप्रेमजन्माभिमानः ॥ ३० ॥
तत्क्षेत्रञ्च (Fol. 4^b) त्रिदिवसरितश्चान्तरा सेवनीयः
श्रीवन्धानक्षितिपतियशोबान्धवः सेतुबन्धः ।
आरूढ़ानां त्रिदिवतटिनीस्नानहेतोर्ज्जनानां
यत्र द्वेधाप्यमरनगरी सन्निकृष्टा विभाति ॥ ३१ ॥
गङ्गां फेनस्तवकमुकुरं वीचिहस्ते वहन्तीं
सेवेथास्तामथ परिसरपौढ़हंसावतंसां ।
प्रत्याहृत्य व्रजति जलधौ प्रेयसि प्रेमलोला
कर्त्तुं केशग्रहमिव किमप्युद्धता या विभाति ॥ ३२ ॥
तोयक्रीड़ासरसनिपतत्(•त)द्ब्रह्मसीमन्तिनीनां
वीचिधौतैः स्तनमृगमदैः श्यामलीभूय भूयः ।

भागीरथ्यास्तपनतनया यत्र निर्याति देवी
देशं यायास्तमथ जगतीपावनं भक्तिनम्रः ॥ ३३ ॥
संसर्पन्तीं प्रकृतिकुटिलां दर्शितावर्त्तचक्रां
तामालोक्य त्रिदशसरितो निर्गद(ताम)म्बुगर्भात् ।
सा(मा ?) निर्मुक्तासितफणिवधूशङ्कया कातरा(रो) भू-
भीतः सर्व्वो भवति भुजगात् किं पुनस्त्वदृशो यः ॥ ३४ ॥
क्रीड़न्तीनां पयसि रभसात्तत्र लीलावतीनां
वीची(चि)हस्तै रचय कुचयोरंशुकस्रंसनानि ।
सद्यस्तासामपि च रमणालोकनव्याकुलानां
यान्तु क्रीड़ा (Fol. 5^a) मसृणहसितान्युत्तरीयाञ्चलत्वं ॥ ३५ ॥
स(स्क)न्धावारं विजयपुरमित्युन्नतां राजधानीं
दृष्ट्वा तावद्भुवनजयिनस्तस्य राज्ञोऽधिगच्छेः ।
गङ्गावातस्त्वमिव चतुरो यत्र पौराङ्गनानां
सम्भोगान्ते सपदि वितनोत्यङ्गसंवाहनानि ॥ ३६ ॥
यत्सौधानामुपरि वड़भीशालभञ्जीषु लीलाः
सुस्निग्धासु प्रकृतिमधुराः केलिकौतूहलेन ।
उन्नीयन्ते कथमपि रहः पाणिपङ्केरुहाग्र-
स्पर्शोद्गच्छत्पुलकमुकुलाः सुभ्रुवो वल्लभेन ॥ ३७ ॥
स्निग्धश्यामा रमणमान(मणि)भिर्बद्धमुग्धालवालाः
पौरस्त्रीभिः क्रमुकतरवो रोपिताः प्राङ्गणेषु ।
यत्रायत्नोपगतसलिलैर्नक्तमासिक्तमूला
नापेक्ष्यन्ते परिजनवधूपाणिविश्राणिताम्भः ॥ ३८ ॥
गङ्गास्ले(श्ले)षप्रकृतिविमले पालिते तेन राज्ञा
जाता लोकद्वितयविगलद्भीतयो यत्र पौराः ।
बाला भ्योऽथ प्रणयकलहे रूढ़कोपाङ्कुरे(रा)भ्या(भ्यो)
वित्रस्यन्ति भ्रुकुटिरचनाचारुभीमाननाभ्यः ॥ ३९ ॥
स्नातुं कर्णात् प्रणिहितपदं साञ्जनैरश्रुलेशै-

रुद्धं ताप (Fol. 5^b) ग्लपितविसिनीतन्तुना बन्धनेन ।
यत्र स्त्रीणामधररुचकन्यस्तसिन्दुरमुद्रं
तालीपत्रं प्रणयिनि जने प्रेमलेखत्वमेति ॥ ४० ॥
भर्त्तुः स्वैरं सुरतजनितस्वेदविन्दून् विनेतुं
यत्र स्वेच्छादगलितनिजग्लानिभिर्म्मुग्धदारैः ।
सौधा(धो)त्सङ्गे शशधररुचस्तन्तुजालप्रविष्टा
व्याहृ(कृ)ष्यन्ते रुचिरचमरीबालभारभ्रमेण ॥ ४१ ॥
रुद्धोष्माण स्तनपरिसराः कुङ्कुमस्याङ्गरागा
दोलाः केलिव्यसनरसिकाः सुन्दरीणां समूहः(हाः) ।
क्रीड़ावाप्यः प्रतनुसलिला मालतीदाम रात्रिः
स्थानज्योत्स्ना मुदमविरतं कुर्व्वते यत्र यूनां ॥ ४२ ॥
भ्राम्यन्तीनां भ्र(त ?)मसि निविड़े वल्लभाकाङ्क्षिणीनां
लाक्षारा(गा॰)श्चरणगलिताः पौरसीमन्तिनीनां ।
रक्ताशोकस्तवकललितैर्व्वालभानोर्म्मयूखै-
र्नालक्ष्यन्ते रजनिविगमे पौरमार्गेषु यत्र ॥ ४३ ॥
रत्नैर्म्मुक्तामरकतमहानीलसौगन्धि (Fol. 6^a) काद्यैः
शङ्खैर्व्वालावलयरचनाबन्धु(भि *)र्विद्रुमैश्च ।
लोपामुद्रारमणमुनिना पीतनिःशेषवारः
श्री(ः)सर्व्वस्वं हरति विपदं(पुलं) यत्र रत्नाकरस्य ॥ ४४ ॥
मूकीभूतां मरकतमयीं हारयष्टिं दधाना
यस्मिन् बाला मृगमदमसीपिच्छिलेषु स्तनेषु ।
चेतोवर्त्तिस्मरहुतवहं दीपितं स्नेहपूरैः
कृत्वा यान्ति प्रियतमगृहानन्धकारे घनेऽपि ॥ ४५ ॥
नीतं यत्नादविनयलिपेः पत्रतामायताक्ष्या
निर्गच्छन्त्यः सपदि हृदयं क्षालयित्वेव यत्र ।
कान्ते पादप्रणयिनि मिलत्कज्जलश्यामलाना-
मुन्मुच्यन्ते नयनपयसां श्रेणयो मानिनीभिः ॥ ४६ ॥

अग्रे तेषां व्यपगतमदः स्थातुमेवासमर्था
दृष्ट्वा कान्तिं कुसुमधनुषः का कथा विक्रमस्य ॥
सुभ्र(भ्रू) लीलाचतुरनयनक्षेपरम्यैर्व्विलासै-
र्यस्मिन् यातास्तदपि सुदृशां किंकरत्वं युवानः ॥ ४७ ॥
त्वय्यासीने मनसिजगु(Fol. 6^b)रौ यत्र सारङ्गनेत्राः
संदृश्यन्ते रचितचतुरोद्यानदोलाविलासाः ।
अभ्यस्यन्त्यः सरभसमिव व्योमकान्तारयानं
कन्दर्पस्य त्रिदिवयुवतीं जेतुकामस्य सेनाः ॥ ४८ ॥
प्रासादानां दिनपरिणतौ(ग *)र्भदग्धागुरूणां
जालोद्गीर्णः (स *)जलजलदश्यामलो यत्र धूमः ।
सद्यः क्रीड़ा कुत(तु)करभसारूढ़पौरीमुखेन्दु-
ज्योत्स्नासङ्गप्रसमरतमः श्रेणिशङ्कां तनोति ॥ ४९ ॥
व्यर्थीभूतप्रियसहचरीचारुवाचां निशीथे
रोषादस्त्रीकृतकुवलयोत्तंसविस्रंसि माल्यं ।
यूणां यत्र प्रणयकलहे केलिहर्म्याग्रभाजा-
मिन्दुः प्रत्यादिशति सविधीभूय शश्वत् करेण ॥ ५० ॥
तत्र स्वेच्छारतिविनिमये चैव सीमन्तिनीनां
कर्णस्वंसि प्रकृतिसुभगं केतकीगर्भपत्रं ।
उत्पश्यन्ति व्यतिकरचलत्कुण्डलाघट्टनाभि- [५१ ॥
र्भिन्नं साक्षादिव मुखविधोः खण्डमेकं विद(Fol. 7^a)ग्धाः ॥
वाचः श्रोत्रामृतमनुगतभ्रूविलासाः कटाक्षा
रूपं हस्तोच्चयसमुदितं द(स्नि)ग्धमुग्धाश्च हाराः(वाः) ।
यातं लीलाञ्चितमकृतकं यत्र नेपथ्यमेतत्
पौरस्त्रीणां द्रविणसुलभा प्रक्रिया भूषणस्य ॥ ५२ ॥
पुञ्जीभूतं जगदिव ततः सप्तकक्षानिवेशै
र्म्यं याया भवनमवनीमण्डलाखण्डलस्य ।*
यत्सौधानां शिखि(ख)रिसुहृदां मूर्ध्नि विश्रान्तमेघे

विद्युल्लेखा वितरति मुहुर्वैजयन्तीविलासं ॥ ५२ ॥
स्निग्धश्यामैरिव विरचिता दारि(द्रावि ?)तैरिन्द्रनीलै-
र्व्वापी तस्मिन्नवनिवनितारम्यरोमावलीव ।
यस्यास्तीरे विहरदनतिप्रौढसीमन्तिनीनां
मन्ये लीलागतिषु गुरवो राजहंसा भवन्ति ॥ ५४ ॥
देवं साक्षान्मनसिजमिव प्राप्तराज्याभिषेकं
सेवेथास्त्वं व्यथितसमये चामरग्राहिणीभिः ।
यस्य स्निग्धस्फुरदसिलतास्था(धा)रगत्या जनानां
लब्धः संख्ये रिपुकुलवधूलोचने संविभागाः(गः) ॥ ५५ ॥
यस्यौत्सुक्यादसमसमरालोकनोन्म(न्मा)दभाजां
स्वर्गस्त्रीणामपरिगणितस्रस्तलोलाञ्चना(ला)नां ।
मन्ये राधाचतुरतुरगोत्खातरेणुप्रतानः
सद्यो लग्नः स्तनकलसयोरन्तरीयत्वमेति ॥ ५६ ॥
भुग्नग्रीवं भुजविल(स)स(ल)तासक्तवक्त्राम्बुजा (Fol. 7^{b}) भिः
सोऽयं सेवा(ना)न्वयनृप इति त्रासकौतूहलाभ्यां ।
विष्वक् पीतः कुवलय(दल *)श्रेणिदीर्घैः कटाक्षैः
पौरस्त्रीभिः सपदि नगरीविद्रवे विद्विषां यः ॥ ५७ ॥
बद्धस्क(द्धाक्र ?)न्दा विहगरुदितैर्विभ्रती चेतसीव
क्रीड़ागारे सुचिरलिखितामाकृतिं वल्लभस्य ।
प्रौढ़ारामायदरिनगरी सौधसंजातदुर्व्वा-
जालव्याजादलकपटलीं दूरनम्रां विभर्त्ति ॥ ५८ ॥
क्रीड़ारोषे सुतनुवचनाहन्यमानस्य पत्युः
प्रत्युद्गच्छत्पुलकपटलेनापि वाधां दधाना ।
भ्राम्यस्यद्रेर्व्वनभुवि कथं क्रूरदर्भाङ्कुराया-
मेवंप्राया यदरिनगरीद्वारिकाणां विलासः(पः) ॥ ५९ ॥
तस्मिन्काले क्वचिदपि स चेद्वासरस्य त्रिभागं
राजा प्राप्तो गमयति रहश्चिन्तयान्वा(यन्न ?)न्तरायान् ।

सन्देशो मे न पवन तदा किञ्चिदावेदनीयः
कार्य्योत्तप्ते मनसि लभते नावकाशं विलासः ॥ ६० ॥
आसाद्यातः कमपि समयं सौम्य वक्तुं विविक्ते
देवं नीचैर्विनयचतुरः कामिनां(नं) प्रक्रमेथाः ।
अप्यन्येषु प्रणयिभिरभिव्यञ्जितः कार्य्यभागः
सिद्धिं गन्तुं प्रभुरवसरे किं पुनः पार्थिवेषु ॥ ६१ ॥
श्रीखण्डाद्रे(Fol. 8^a)र्व्वसति शिखरे कोऽपि गन्धर्व्वलोक-
स्तत्रास्त्येका कुवलयवती नाम मन्याङ्गनानां ।
दूतं तस्याः कलयो(य)(मलयो*)पत्यकामारुतं मां
कामिद्वन्द्वं घटयति मिथो विप्रयुक्तं य एकः ॥ ६२ ॥
जित्वा देव त्वयि सरभसं दाक्षिणात्यान् क्षितीशान्
प्रत्यावृत्ते मलयकटकाच्चित्तमादाय तस्याः ।
दूरं याते(न*) किमितरियावृत्तिरभ्येति तस्या
वाष्पोत्पीडा सपदि पदवीं संरुरोधेक्षणस्य ॥ ६३ ॥
विन्यस्याग्रं भुवि चरणयोः कौतुकोत्तम्भिताक्षी
त्वत्संपर्कप्रकृतिसुभगामुन्नतग्रीवमाशां ।
उत्पश्यन्ती किमपि सुतनुर्लक्ष्यते सौधशृङ्गा-
दुद्भिन्नाश्रुस्थगितमसकृत् त्वत्समीपं यियासुः ॥ ६४ ॥
यस्मिद(न्) काले नयनविषयं सा (धु ध *) (न्यो)सि नीतः
शारङ्गाक्ष्या सकल(ललना * ?)लोचना(न *)न्दकारिन् ।
जाने तस्मात् प्रभृत(ति ?)जनितस्वान्तसन्तापखेदा
सा रम्येषु क्वचिदपि न विश्वासमेकान्तमेति ॥ ६५ ॥
मुष्टिग्राह्यं किमपि विधिना कुर्व्वता मध्यभागं
मन्ये वाला कुसुमधनुषो निर्म्मिता कार्म्मुकाय ।
राजन्नुच्चैर्व्विरहजनितक्षामभारं(वं) वहन्ती
जाता संप्रत्यहह सुतनुः सा च मौर्व्वीलतेव ॥ ६६ ॥ (Fol. 8^b)
कीदृक(क्) कान्तः कथय तरले वर्त्तते यस्तवान्त-

र्यत्नादित्थं सुभग वहुशः पृष्टयालीजनेन ।
निःश्वस्योच्चैः कथमपि तया स्तम्भिताश्रुप्रवाहा
न्यस्तादृष्टिर्लिखितमदने भित्तिभागे गृहस्य ॥ ६७ ॥
धत्ते सद्यस्त्वदुपगमितप्रेमलेखभ्रमं सा
तालीपत्रे प्रियसहचरीकर्णपाशच्युतेऽपि ।
किञ्च क्रीड़ाशुकमपि (मुहुः *) पृच्छति त्वत्प्रवृत्तिं
गाढ़ोद्भूतः क्व खलु गणयत्यन्वयं त्वर्थिभावः ॥ ६८ ॥
नोत्तं सत्त्वं दृशमपि नयत्युत्पले बद्धकोपा
माल्यैः क्लान्ता न भुजलतिकामप्यसौ संवृणोति ।
पद्मोद्विग्ना हृदयनिहितात्तापसंपत्तिहेतो-
रालीहस्तादपि च सहसा मि(मी)लिताक्षी विभा(भे)ति ॥६९॥
अभ्यस्यन्ती सरसकुसुमस्रस्तरोः प्रान्तसुप्ता
शुष्यत्पङ्कप्रकरसफरीसंभ्रमोद्वर्त्तितानि । [चा(च्चा)लयन्ती
धारावाष्पं(ष्पै) न(नं)यनगलनी(लितैः)लालतां(कुन्तलं ?)
मन्ये बाला गमयति पुनः सा कथञ्चिद्दिनानि ॥ ७० ।
अन्तस्तापं तुहिनपयसामप्यनुच्छेद्यमाप्य
त्वत्तो बाला मलय(ज *)रजः श्रो(स्रो)तसामप्यसाध्यं ।
धत्ते निन्दां कुसुमविशिखे(*)यन्तसादृश्यमूढ़ा [॥ ७१ ॥
सुस्थापि स्यात् किमिह विरहव्या(Fol. 9^a)कुला विभ्रमिन्यः
द्वेषः क्रीडाविपिनवसु(स)तौ चन्दनाम्भोनिषेधः
प्रत्याख्यानं सरसनलिनीतालवृन्तानिलस्य ।
जात त्तस्यां कथमपि सखी बुद्धिजस्त(स्त्व)द्वियोगे
मूर्च्छावेगव्यपगमविधेरेष एव प्रकारः ॥ ७२ ॥
धत्ते द्वेषं शशिनि कुरुते न ग्रहं केशहस्ते
दूरे हारं क्षिपति रमते निन्दया चन्दनस्य ।
वक्तुं देव त्वयि परमसौ मामा(म)वस्थां कथञ्चि-
द्व्रीड़ोद्वेगा नयति कविता चिन्तया वासराणि ॥ ७३ ॥

आदौ याते नयनपदवीं स्तम्भयन(न्) पक्ष्ममालां
चुम्बन् गण्डस्थलभुवमथो पीतविम्बाधरोष्ठैः(ष्ठः) ।
कुर्व्वन् कण्ठहग्र(ग्रह)मपि कुचोत्सङ्गशय्याशयान-
स्तस्या वायुः किमिव न खलु त्वद्वियोगे करोति ॥ ७४ ॥
शारङ्गाक्ष्या जनयति न यद्भस्मसादङ्ककानि
त्वद्विश्लेषे स्मरहुतवहः श्वाससङ्कुक्षिपेऽपि ।
जाने तस्याः स खलु नयनद्रोणिवारां प्रभावो
यद्वा शश्वन्नृप तव मनोवर्त्तिनः शीतलस्य ॥ ७५ ॥
शान्तप्राये रजनिसमये किञ्चिदामीलिताक्षी
प्राप्य स्वप्ने(प्ने) कथमपि पुरस्त्वामतिप्रौढरागा ।
श्चि(श्लि)ष्यन्ती त्वां तनुमनुपदं विप्रबुद्धाथ वाला
लज्जालोलं वलयति दृशं सा सखीनां मुखेषु ॥ ७६ ॥
चन्द्रादस्या(न्या)मुपवनभुवं दूरतो द्वे(Fol. 9^{b})ष्टि वाला
नालापञ्च क्वचनकुरुते सार्द्धमालीजनेन ।
रक्षाहेतोः स्मरविशिखितः केवलं सा वराकी
धत्ते लीलाफलकमुरसि त्वत्प्रतिच्छन्दशोभिः (भि) ॥ ७७ ॥
विन्यश्य(स्य)न्ती शशिनि नयने दुर्द्दिनैरश्रुवारां
धाराश्वाः(श्वा)सैर्व्वकुलकुसुमामोदमाघ्रातुकामा ।
शुश्रुषुश्च भ्रमरविरुतं मूर्च्छया रक्षितासौ
वीक्ष्यावस्थां क इव करुणाकातरः स्यान्न तस्याः ॥ ७८ ॥
चेतोवृत्तिः स्फुरति करुणाविप्रयोगे विरागः
कोपावेशः कुसुमविशिखे नित्यमामेन्य(?)वद्धा ।
इत्थं स्वाङ्के स्थितमिव समालम्ब्य चित्रावराकी
त्वय्येकान्तस्थिरविरचितं भावमाविष्करोति ॥ ७९ ॥
प्रागालापाः प्रतिमुहुरपि प्रेमरम्याः सखीनां
त्वय्येकान्तव्यपगतदये सङ्गमाशापि नैव ।
तस्याश्चिन्तां(न्ता-) विरहजनितां(ता-) नाथ विस्मा(स्मा)रयन्ती-

मु(उ)च्चैरेका भवति सततं जीव(वि)तालम्बनाय ॥ ८० ॥
तस्या राजन्ननुभवमन(ना)साद्यहस्तावरोधा-
दूगण्डाभोगे नयनसलिला(ल)स्रोतसा क्षालितेऽपि ।
प्रत्यासन्नः स्तनपरिसरे चेतसा त्वां वहन्त्याः
प्रालेयांशुर्न्नृपतिककुदच्छत्रभङ्गीं विभर्त्ति ॥ ८१ ॥
यातः क्षक्र(क्ष्रा)त्तुहिन समयः संप्रति त्वत्सकाशा-
दागच्छन्तीं स(प)वन (Fol. 10^{a})लहरीमप्यनासा(स्वा)दयन्त्याः।
कः सम्बन्धे(द्ध) परभृतवधूकेलिवाचाललोले
चैत्रे तस्याः कथय सुभग प्राणरक्षाभ्युपायः ॥ ८२ ॥
भूयोभूयः प्रविशति मनो दारुणो मन्मथाग्नौ
मग्नं वास्याम्भसि नयनयोर्व्वन्धमिन्दीवराक्ष्याः ।
तस्या राजन्ननुविरहव्याकुलायास्तपस्वी
जातो भस्मच्छुरित इव च क्षामपाण्डुः कपोलः ॥ ८३ ॥
राजा(ज)न्नुर्व्वीवलयवनिताकामुक त्वत्सकाशा-
दाशातन्तुर्भवतु सुदृशो दुर्ल्लभः प्रेमतन्तुः ।
कष्टात्कष्टं पुनरिदमहो स्वप्नसङ्केतदूती
निद्राप्यस्याः क्षणमपि न यन्नेत्रसीमानमेति ॥ ८४ ॥
प्रत्यावृत्ता स्तनपरिसराच्चन्दनस्फीतमूर्त्तेः
श्वासा एव स्मरकृतबह्नोद्दीपनैकप्रगल्भाः ।
तामुत्कण्ठाकुलितहृदयां खेदयन्ति प्रकामं
संप्राप्यन्ते मलयपवनैरेवमेवायशांसि ॥ ८५ ॥
त्वद्वक्त्रानुस्मरणरसिका कातरा च प्रकामं
ज्योत्स्नासिकैर्द्विजपतिमधिक्षेपमा(पा)नं करोति ।
किञ्च देष्ठि त्रिदशभिषजौ सुन्दर त्वां विचिन्त्य
प्रायेणैवं भवति विधुरासन्नमृत्योर्म्मनीषा ॥ ८६ ॥
सा वैरस्यादसितनयना हेमतालीदधा(ला)नां
प्रत्याख्यानात् प्रकृतिसुभगां कर्म्म(केश ?)पाशं विभर्त्ति ।

तद्गात्रानां किमपि सहसा दुर्ब्बलत्वं (Fol. 10^{b}) विचिन्त्य
त्यक्तं त्रासाद्गुणमिव मनोजन्मना कार्म्मुकस्य ॥ ८७ ॥
अप्याजन्मप्रभृतिसुहृदस्वन्द(न *)स्यापराधा-
दध्यास्ते सा न खलु मलयोपत्यकाकाननानि ।
किन्तु द्वेषादुपरि मदनस्येव सर्व्वाङ्गतन्वी
बद्धावेशा मनसि रतये नावकाशं ददाति ॥ ८८ ॥
पीनोद्याने वित(च)रति भृशं यत्नसंरुध्य(द्ध)वाष्पा(ष्पा)
सान्द्रे चन्द्रार्च्चिषि निविशते चन्दनाभ्यक्तगात्री ।
क्रीड़ावापीम(d)भि(d)मरुद(भि *)मुखं धावति व्याकुलासौ
किम्वा नार्य्यो रमणविरहे साहसं नाचरन्ति ॥ ८९ ॥
याता (* :) कण्ठस्थलमपि घनश्वासमात्रावशेषा-
स्तामुत्कण्ठाप्रतनुमसवः सर्व्वथा न त्यजन्ति ।
लब्ध्वा कण्ठप्रणयमथवा तादृशामङ्गनानां
शक्तस्त्यागे क इव भुवने चेतसा विच्युतोऽपि ॥ ९० ॥
क्षीणस्तापो वपुषि विगता नेत्रयोरश्रुधारा
विश्रान्तानि क्रमकृशतनोरङ्गविक्षेपणानि ।
इत्थं शान्ते विरहजनिते व्याधिरागे मृगाक्ष्याः
श्वासस्तस्याः परमुपचितो निवृतेरन्तरायः ॥ ९१ ॥
लीलोद्याने परभृतवधूपञ्चमैः पीड्यमाने
ताम्यन्मूर्त्तिर्म्मलयमरुता केलिवातायनेषु ।
सा नैकत्र क्वचिदपि पदं कातराक्षी विधत्ते
यत् सत्यं न त्रिभुवनमपि प्रीतये दुष्खि(दुःखि) तानां ॥ ९२ ॥
सा सर्व्वत्राप्रतिहतगति (Fol. 11^{a}) वि(र्व्वि)द्यया सत्यपि त्वां
प्रत्याख्यानात् सुभग सहसा बिभ्यती नाभ्युपैति ।
राजानो हि प्रकृतिरसवच्चेतसोऽप्यन्यनारीं
रूढ़प्रेमप्रवलवनिताभीरवो नो लसन्ति ॥ ९३ ॥
तस्यास्तीव्रस्मरकृतभुजा दह्यमानाङ्गयष्टे-

न्यँस्तं सद्यः स्तनपरिसरे चन्दनं शोषमेति ।
उक्तैः किम्बा वक्तृभिरपदारोपितस्वान्तवृत्ते-
स्त्वय्यायत्तः कुवलयदृशो जीवरक्षाप्रकारः ॥ ९४ ॥
इत्याख्याते पुलकिततनुर्म्मेदिनीपुष्पकेतुः
प्रत्युत्थाय प्रणयसुभगं गाढमाश्लिष्यति त्वां ।
वाक्यैरेभिः कर(रु)णमसृणैः कोमलत्वं भजन्ते
ग्रावाणो(ऽ *)पि प्रकृतिसरसः किं पुनस्तादृशो यः ॥ ९५ ॥
सद्यः कृत्वा पवन विनयादञ्जलिं मूर्द्ध्नि किञ्चि-
द्वक्तव्योऽसौ रहसि भवता मद्गिरा गौड़राजः ।
त्वत्तः श्रोष्यत्यवहितमनाः सोऽनुरक्ताङ्गनानां
जायन्ते हि प्रणयिनि सुधावीचयो वाचिकानि ॥ ९६ ॥
पार्श्वे पश्चादपि च पुरतो दर्शयन्नात्मरूपं
व्यक्तं देव त्वमसि जगतामीश्वरः शार्ङ्गपाणिः ।
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कायव्यूहं रचयितुमलं नापरः कैटभारेः ॥ ९७ ॥
सौधोत्सङ्गे मुकुलितदृशं तत्सखीनां पुरस्ता-
न्मामासाद्य त्वमयमकृथा गोचरे यन्न वाचां । [स्यां
तत्कुर्व्वीथाः सुभग न सतां (Fol. 11^b) गर्हशी(णी)या यथा
कन्यालोके (कं ?) न खलु सुधियो भूषयित्वा त्यजन्ति ॥ ९८ ॥
वृत्ते गौरीपरिणयविधौ पीवरप्रीतिभाजा
सृष्टस्येव त्रिपुरजयिना पुष्पकेतु(तो)र्नवस्य ।
राजन्नस्तु प्रणयचतुरो दूरतः प्रेमबन्धः
पुण्येन स्यां तव चरणयोः केन संवाहनेऽपि ॥ ९९ ॥
सन्देशोऽयं मनसि निहितः कश्चिदायुष्मता मे
किम्बा भूयस्त्वयि विरचितै रक्ष भिक्षाप्रकारैः ।
पारार्थैकप्रवन(ण)मनसस्त्वद्विधावास्यमिश्रा-
नापन्नानां न खलु बहुशः काकुवादान् सहन्ते ॥ १०० ॥

दन्तिव्यूहं कनकलतिकां चामरं हैमदण्डं
यो गौड़ेन्द्रादलभत कविक्ष्माभृतां चक्रवर्त्ती ।
श्रीधोयीकः सकलरसिकप्रीतिहेतोर्म्मनस्वी
काव्यं सारस्वतमिव (सतन् *) मन्त्रमेतज्जगाद ॥ १०१ ॥
गोष्ठीबन्धः सकलकविभिर्व्वाचि वैदर्भरीति-
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सत्सु स्नेहः सदसि कविताचार्य्यकं भूभुजां मे
भक्तिर्लक्ष्मीपतिचरणयोरस्तु य(ज)न्मान्तरेऽपि ॥ १०२ ॥
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यावज्जैत्रं कलयति धनुः कौतुकं पुष्पकेतुः ।
यावद्राधारमणतरुणीकेलिसाक्षीकदम्ब-
स्तावज्जीयात् कविनरपतेरेष वाचां विलासः ॥ १०३ ॥

(Fol. 12^a)

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ब्रह्माभ्यासे प्रयतमनसा नेतुमीहे दिनानि ॥ १०४ ॥

इति श्रीधोयीकविराजविरचितं पवनदूताख्यं समाप्तं ॥ * ॥
श्रीश्रीसीतारामाभ्यां नमो नमः । श्रीरामः । श्रीहरिः ॥ ० ॥

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जगत्सृष्टौ यस्य श्रमविरह एव प्रलयतो(ऽ *)पि
पाले नत्वा तं व्रजनगरनारीप्रियतमं ।
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6. *The* Hydra *of the Calcutta Tanks*—By NELSON ANNANDALE, B.A., *Deputy Superintendent of the Indian Museum.*

Description.—Body and tentacles very elongate, the latter not clubbed; body cylindrical throughout; six (sometimes five) tentacles in well-grown, five in young, individuals; ovaries one or two, testes numerous. Testes and ovaries do not occur together on the same individual. *Coloration.*—Tentacles and base milky white; distal portion of the body either pale or dark olive-green, deep chestnut, orange-brown, pale brown, cream-colour or dirty white; never bright green.

When I exhibited specimens of the Calcutta Polyp to the Society I was inclined to regard it at most as a variety of *Hydra viridis*, using the specific name in a more extended sense than its author Linnæus adopted, to include *H. fusca*. A careful study of the descriptions of the European forms and an examination of a larger number of Indian specimens has since led me to doubt whether I was correct; in coming to a decision I am indebted to a note received from my friend Dr. J. H. Ashworth, of the University of Edinburgh, who has not, however, seen the Indian form. On the whole this form appears to be related to Pallas' *H. vulgaris;* but the question of specific characters, in animals so simple and so variable in appearance from moment to moment, is a very difficult one. From typical specimens of *H. vulgaris*[1] it differs in several important details.

When the animal is clinging to an inclined or vertical surface the expanded tentacles are arched, their proximal portion projecting in a straight line from the disk, while the distal extremity either falls downwards or extends upwards. Every phase of colour may be found in the same tank, but the darker specimen are more common over deeper water. Specimens kept in a bright light fade so as to become of an almost pure and uniform white, whatever their original coloration may have been.

The Polyp is usually found on the under surface of the floating leaves of water-plants. It is by no means uncommon but may be a little hard to find. Sexual reproduction takes place at any rate from December to March, but probably ceases at the commencement of the hot weather.[1] Budding occurs simultaneously. I have not seen more than two buds on one adult at the same time, and one is commoner; nor have I seen an attached bud budding. The food consists chiefly of small Crustacea and worms. Large Daphniids on coming in contact with the nematocysts are temporarily paralysed but break loose through their own weight and recover movement after a few minutes. Adult Polyps show little inclination to leave a situation in which they have settled, and buds rarely move far from their parents; consequently, large numbers of individuals may often be found within a small radius in the tanks, though there may be none on the surrounding plants. In an aquarium they desert the water-plants and take up a position on the side of the glass farthest from the light. If starved they become extremely pale and attenuated within a day or two, their colour disappearing very much more rapidly than it does when they are well fed but kept in a bright light. They do not seem to be able to endure a change of temperature such as that brought about by the sun shining directly on the surface of the water in a large glass jar.

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[1] I have just seen Downing's recently published summary of what is known regarding the species of *Hydra*, in his paper on "The Spermatogenesis of *Hydra* (*Zool. Jahrb., Anat.*, 1905) He recognizes, on what appear to be sufficient grounds, the following four, with one variety of the first:—(1) *H. viridis*, Linn.; (2) *H. grisea*, Linn. (with *H. vulgaris*, Pall., as a synonym); (3) *H. fusca*, Linn.; and (4) *H. diœcia*, Downing. If sexual characters are to be taken into account, as has been done in constituting *H. diœcia*—and the only objection is that a specimen which it is desirable to identify may not be breeding—then the Indian *Hydra* should be regarded as a distinct species, though it may only be protandrous or the converse. Under the circumstances it will be convenient to give it, at any rate provisionally, specific rank, calling it *H. orientalis*. The description above is a sufficient diagnosis. June 6th, 1905.

So far as I am aware, the genus *Hydra* has not previously been recorded from British India, but a species (*H. fusca?*)[2] is reported from Tonkin. The late Professor J. Wood-Mason, as Major Alcock informs me, collected many specimens in Calcutta. I have myself seen a species (probably the same as the Calcutta one) in an aquarium in the Experimental Gardens at Penang.

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[1] Since the beginning of the hot weather my captive specimens have disappeared, and I have not been able to find any free in the tanks. April 12th 1905. This remark still holds good. July 21st, 1905.

[2] Richard, *Mem. Soc. zool. France*, vii, p. 237. What may be the same species is recorded from Turkestan (Daday, *Zool. Jahrb. Syst.*, 1904. p. 480).

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7. *The Composition of the oil from Bir Bahoti or the "Rains Insect,"* (Trombidium grandissimum).—By E. G. Hill, B.A., F.C.S.

The animal known to natives as *bir bahoti* and which is described as the "rains insect," the "red velvet insect," the "lady cow," in the Cyclopædia of India, and as *Bucella carniola* in Platts' dictionary, is a red mite about half an inch long and from a quarter to three-eighths of an inch in its widest part. It is covered with a scarlet, velvety down, and appears on the ground at the beginning of the rainy season. It is only to be found for a few weeks in the year, but it has a great reputation among Mahomedans as an aphrodisiac, so it is collected and kept for sale in the bazaar. The insects from which the author extracted the oil for his experiments were purchased from a dealer in Allahabad city. They had been kept for several months, but had not putrified at all. On pressure they exuded a deep red oil. It is this oil which is used medically as an external application. The Cyclopædia quoted above states that the oil is used as a counter-irritant, but it appears to have no such properties, and its efficacy as a medicine is probably purely imaginary and due to its colour.

About a pound of the insects were extracted with ether in a Soxhlet's apparatus. The extraction was carried on till the ether came over colourless, and the various fractions were then mixed together and the ether evaporated. The oil was slightly wet and it was dried over a little calcium chloride. Thus obtained it was almost as deep in colour as bromine. It had a specific gravity of ·907 at 15°C. On being kept at that temperature for a day or two, it set to a semi-solid mass which melted at 18°-19°. The oil had a very peculiar odour somewhat resembling that of Malwa oil of opium. It began to boil with decomposition at 240°. The first portions of the distillate were liquid, but subsequently at a higher temperature solid products also passed over. These were all colourless. Acrolein was obviously one of the products.

With strong sulphuric acid the oil gave a vivid blue colour which turned to green. With nitric acid all colour was destroyed. Cold potassium hydrate, chlorine water, hydrochloric acid and ferric chloride had no action on the oil.

The oil readily dissolved in ether, but alcohol left a small portion undissolved. This was of the same red colour as the original oil: it was more soluble in hot alcohol, but was thrown out of solution as the alcohol cooled.

With nitrous acid the oil gave a buttery elaïdin in a few hours.

On distillation in steam partial hydrolysis took place, and the distillate had a pungent odour which seemed to be that of butyric acid. This acid was recognized by neutralizing the distillate with potassium hydrate and evaporating to dryness on the water bath. The salt thus obtained was treated with alcohol and a few drops of sulphuric acid, and warmed, when the distinctive odour of ethyl butyrate was obtained. The distillate with steam also contained a small quantity of a solid acid.

The following values were obtained for the oil by the usual methods. It determining the saponification value aniline blue was used as an indicator and gave fairly good results, the very deep colour of the oil making very accurate observations extremely difficult :—

Sp. Gr. at 15° ...	... ·906–907	Mean of three determinations.
Acid value ...	... 62·3	
Saponification value	... 194·7	
Ester value ...	... 132·4	
Unsaponifiable ...	... 3·7 per cent.	
Reichert-Meissl value	... 0·55	
Hehner value	... 94	
Iodine value	... 65	

The unsaponifiable matter above was extracted with ethyl ether from a solution of the soda soap. It contained a good deal of colouring matter.

Preliminary examination.—As a preliminary examination part of the extracted oil was saponified with potassium hydrate and the fatty acids liberated. These were then fractionally precipitated with an alcoholic solution of magnesium acetate. The various fractions were decomposed with hydrochloric acid, and the melting points of the free acids thus obtained were all between 48° and 66°. The above indicated the probable presence of a mixture of the glycerides of the more commonly occurring fatty acids, but recrystallization of the six fractions of the free acids obtained from the magnesium soap gave a comparatively large amount of an acid melting at about 52°, which seemed to indicate the possibility that there was a large amount of myristic acid in the oil.

Unsaponifiable matter.—A quantity of the oil was carefully saponified with alcoholic potash, and the soap dried on clean sand. This was then extracted with ethyl ether in a Soxhlet apparatus. The extract contained soap, so it was dried on sand and extracted a second time. The insoluble portion was added to the soap left from the first extraction. The ether extract seemed to contain some unsaponified oil, so it was saponified a second time and again extracted with ether. On evaporation of the extract the solid product was apparently free from soap or oil. This was fractionally crystallized from alcohol in two fractions which had melting points of 106° and 95°. These fractions were separately acetylized by boiling with acetic anhydride under an inverted condenser, and the acetates precipitated by pouring into boiling water. The acetaes were carefully washed and crystallized from alcohol when their melting points were 98° and 68° respectively. The acetates were decomposed with potassium hydrate and the alcohols taken up in ether. The extracts were evaporated to dryness and crystallized from alcohol and had melting points of 110° and 104° respectively.

Neither of the products thus obtained crystallized in the characteristic manner of cholesterol. The crystals were thin plates, but their shape was quite irregular. Tested for cholesterol by the colour reactions the results were as follows :—

A solution of a very small quantity in acetic anhydride gave an intense blue colour on the addition of strong sulphuric acid drop by drop, and the same result was obtained by Burchard's modification of the above test in which the cholesterol is first dissolved in 2 c.c. of chloroform, and then treated with 20 drops of acetic anhydride and one drop of sulphuric acid. Salkowski's modification of Hager's reaction gave the colour which is characteristic of cholesterol. A minute quantity was dissolved in 2 c.c. of chloroform and an equal volume of concentrated sulphuric added to it and the mixture shaken. On separating, the chloroformic layer was coloured red, and on standing changed to purple on the following day when the lower layer had a decided green fluoresence. It should be stated that the unsaponifiable matter used in the above tests was quite free from colour.

These reactions and the melting point of the alcohols obtained indicate the presence of cholesterol, and possibly of a fatty alcohol of high molecular weight. The amount of unsaponifiable matter available was too small for further investigation.

The Fatty acids.—The soap freed from unsaponifiable matter was treated with dilute hydrochloric acid, and heated to liberate the fatty acids. These were thoroughly washed and dried in a steam-oven. They were still tinted red, but not enough so to render impossible the use of phenol-phthalein as an indicator.

For the mixed fatty acids the following values were obtained :—

Saponification value	199
(Hence mean mol. wt.	282)
Iodine value	66·6
Melting point	31°–32°

It is stated by Lewkowitsch that when the mixed fatty acids are triturated with alcohol specific gravity ·911, the unsaturated acids are almost completely dissolved. Accordingly the mixed acids obtained as above were treated in that way in the cold and filtered. The filtrate was reserved for treatment by Varrentrap's method. The residue of saturated acids was washed with alcohol sp. gr. ·911 and fractionally crystallized from absolute alcohol. Three fractions were thus obtained, and each of these was recrystallized three times from hot alcohol. The melting points were then 54°, 53°, and 53°. 5. After a fourth crystallization the melting points were 54°. 7, 53°. 4 and 53°. 6, respectively. They were thus very nearly pure, but not quite, and the presence of myristic acid with a small quantity of palmitic or stearic acids was indicated. The three fractions were mixed and put on one side.

The filtrate from the alcohol sp. gr. ·911 were evaporated down to dryness and saponified with an alcoholic solution of potassium hydrate. The soap was exactly neutralized with acetic acid and poured in a thin stream into a boiling solution of lead acetate (7 per cent.) with constant agitation. The operation was conducted in a flask according to Tortelli and Ruggeri's modification of Varrentrap's method. The solution was cooled and the supernatant liquid poured off and the lead salt washed with lukewarm water and then dried with filter paper. The lead salts in the flask were then warmed with ether on the water bath, and shaken, until they had completely disintegrated. The flask was kept at a temperature of 10° for 24 hours, and then the liquid was filtered. The filtrate was decomposed with dilute hydrochloric acid, washed, and the ether evaporated off in a stream of dry carbonic acid. The unsaturated acids obtained in this way gave an iodine value of 84. They were almost colourless, having a faint yellow tint, and remained liquid at the temperature of the laboratory, which was about 17° Centigrade. Compared with the acids left after trituration with alcohol ·911, the amount was not large.

The lead salts, insoluble in ether, were also decomposed with hydrochloric acid and washed and dried. The acids were then added to the mixed fractions from trituration with alcohol mentioned above. This mixture then contained all the saturated fatty acids.

These mixed saturated acids were then treated according to a suggestion of Partheil and Feriè. The solubilites in alcohol of the lithium salts of oleic lauric, myristic, palmitic and stearic acids differ sufficiently for it to be theoretically possible to separate them. In the following, Partheil and Ferie's directions were followed, but the alcohol used was the "absolute alcohol" of the laboratory and was subsequently found to have a sp. gr. of ·809.

The acids (8 grams) were saponified with 120 c. c. of half normal alcoholic potash, and the soap dissolved in 800 c.c. of 50 per cent. alcohol. A ten per cent. solution of lithium acetate in 50 per cent. alcohol was added, and the mixture warmed on the water bath to 60°. Nearly the whole of the precipitate formed at first passed into solution, and on cooling, a quantity of minute crystals separated out. These were filtered off, washed with 50 per cent. alcohol, and the filtrate which should have contained lithium oleate, together with the lithium salts of the less saturated acids, was put on one side.

The lithium salts precipitated on cooling the solution in 50 per cent. alcohol were dissolved in hot absolute alcohol A large amount was required, but the whole of the precipitate was brought into solution. The solution was then allowed to stand in the cold for 24 hours, at the end of which time there had settled down a precipitate which should have been the lithium salts of palmitic and stearic acids. There was only a small quantity of this precipitate, but it was filtered off, the free acid liberated in the usual manner, well washed and crystallized from alcohol. The acid thus obtained had a melting point of 54°.5 to 55°, and was probably a mixture of stearic and myristic acids in equal proportions. According to Reintz such a mixture melts at 54°.5, and as will be shown later there were clear indications of the presence of stearic acid in the oil.

The filtrate from the solution in absolute alcohol should have contained only lithium myristate. The alcohol was evaporated off and the salt decomposed with hydrochloric acid and washed. It melted at 53°.7, and after recrystallization at 53°.8. Myristic acid melts at 53°.8.

Combustion of ·1077 gram gave—

H_2O ·1162 gram, *i.e.*, 11·98 per cent. hydrogen.
CO_2 ·2777 gram, *i.e.*, 70·3 per cent carbon.

Myristic acid, $C_{14}H_{28}O_2$, gives 11·8 per cent. hydrogen and 70·5 per cent. carbon.

This acid was obviously pure myristic acid.

The filtrate from the solution in 50 per cent. alcohol was evaporated down and decomposed with hydrochloric acid. The free acids thus obtained were liquid at the temperature of the laboratory, showing that all the liquid acids had not been removed by the trituration with alcohol sp. gr. 911. The amount was too small for further examination.

In the above work there is uncertainty as to the presence of stearic acid, and owing to the method adopted for the separation of the fatty acids it appeared desirable to make a separation *ab initio* by means of the lead salts and redetermine the iodine value for the unsaturated acids. Accordingly a fresh lot of the mixed fatty acids was saponified. The soap was converted into the lead salts and these treated according to the method of Tortelli and Ruggeri. The solid and liquid acids were thus separated. The liquid acids on standing for a few days at 18° had deposited a few small needle-like crystals which melted or dissolved in the liquid acid on slightly warming it. These are mentioned below.

The solid fatty acids were converted into their lithium salts as before, and the 50 per cent. alcoholic solution was heated to 60°, cooled and filtered. The filtrate gave liquid acids on hydrolysis. These were added to the liquid acids obtained from the lead salts. The salts on the filter were digested with absolute alcohol and filtered hot in a hot water funnel. This step was rendered necessary by the fact that the dissolved myristic acid began to crystallize out as soon as the temperature fell more than a few degrees. The precipitate left after filtering the hot solution gave on hydrolysis a small quantity of acids which was dissolved in boiling alcohol. The crystals were pressed in filter paper. This was repeated four times, and after each crystallization the melting point of the crystals was taken. These were 49°.5, 51°.5, 53°.5, 62°.6. The remaining acid was fractionally crystallized in two fractions, and the melting point of each fraction was found to be 64°.5. Since this is above the melting point of pure palmitic acid it may be taken as certain that stearic acid in small quantity is present in the oil.

The filtrate from the hot alcohol solution was cooled. There was a copious deposit of lithium myristate. This was filtered off and the freed acids were crystallized in three fractions which had melting points of 53°·7, 53°·8 and 53°·8 respectively. The acid was thus pure myristic acid. The filtrate from this lithium myristate was evaporated down and the acid liberated in the usual manner. It was myristic acid with the melting point 53°.4, and after crystallizing from alcohol, 53°·7. The unsaturated fatty acids obtained in the second series of operations had deposited a few white crystals after standing for two days at a temperature of 20°. As it was possible that they might still contain a small amount of solid acids they were again converted into the lead salts and treated with ether as above described. The acid thus prepared again deposited crystals in two days at 18°, but the iodine value was 94°.5, so it was probable that the solid acid was an unsaturated acid.

For the investigation of this solid acid the crystals were filtered off, and freed as far as possible from all liquid acids by gently pressing them between filter paper. The acid was distinctly solid and was quite white. The amount was only 0·1390 gram which had the iodine value of 67. The iodine value of the liquid filtered off was again taken to see whether it had undergone any alteration. It was found to be 67 when taken at the same time as that of the crystals, and when taken four days later after exposure to air was found to be less still. Since the original value was 95, it seems likely that the unsaturated acids consisted mainly of oleic acid, and possibly of a lower acid of the same series. The change in the iodine value would be due to oxidation or decomposition. These changes seem similar to those experienced by Senkowski (*Zeit. f. Physiolog. Chem.* 1898, 434).

The acids isolated were present as glycerides as is shown by the saponification value of the oil. Glycerol was, however, isolated in the usual way by saponifying the oil, removing the fatty acids and neutralizing the remaining solution. This was then evaporated to dryness and extracted with alcohol. The extract after removal of the alcohol was a rather dark liquid readily miscible with water. It gave all the reactions of glycerol.

Conclusion.—The above experiments point to the conclusion that the oil is principally composed of myristodiolein, and that there are also present small quantities of stearin, cholesterol and colouring matter. The butyric acid may be the result of decomposition. There is possibly also present an alcohol of high molecular weight belonging to the fatty series of carbon compounds.

In the above it will be seen that the author's results regarding the separation of stearic and myristic acid do not agree with those of Partheil and Feriè. The latter state that when a mixture of stearate, palmitate and myristate of lithium are heated with absolute alcohol so as to dissolve the salts, only the stearate and palmitate separate out on cooling, while the myristate remains in solution. Lewkowitsch, indeed, suggests a method of separation of the acids based on their work, but he qualifies his remarks by the statement that Partheil and Feriè worked on such small quantities that their results need confirmation. What is probably the case is that owing to the greater solubility of the lithium salt such a separation is possible when the amount of myristic acid is not in very large proportion to the stearic and palmitic acids, but that when it is large the method needs modification. The author proposes to investigate this question.

8. Contributions to Oriental Herpetology II.—*Notes on the Oriental Lizards in the Indian Museum, with a List of the Species recorded from British India and Ceylon.* Part I.—*By* Nelson Annandale, B.A., *Deputy Superintendent of the Indian Museum.* (With 2 plates.)

The collection of lizards in the Indian Museum is mainly Indian and Burmese, including examples of the great majority of the indigenous species; but interesting material from neighbouring countries, specially Persia, Eastern Turkestan, Yunnan, Siam and Malaya, is also included. Of forms from more distant regions only a comparatively small number are represented, one of the most noteworthy being the rare and peculiar Australian Ball-tailed Gecko, *Nephrurus asper*,[1] of which a good specimen was obtained in exchange with the Queensland Museum some years ago, under a wrong identification. The Skinks and Lacertidæ of Palestine, however, are well represented by the collection of the late Dr. J. Anderson. Regarding the majority of our Oriental specimens, an examination adds little to the systematic and geographical knowledge to be found in Mr. Boulenger's works. Of a few, however, this is not the case; for there are still parts of India—the country between northern Assam and southern Tenasserim is one of them—of which even the systematist has not yet exhausted the vertebrate zoology, and from which the Museum possesses specimens not examined critically until within the last few months.

In the light chiefly of Mr. Boulenger's volume in the "Fauna of India" and subsequent papers, it is no longer possible to maintain many of the older Indian naturalists' identifications, whether published or in manuscript, and he has recently pointed out that the names of two of the commonest of our Indian lizards cannot stand—that *Hemidactylus coctæi*, D. & B., the common house-lizard of Calcutta, must be known as *H. flaviviridis*, Rüpp, while *H. gleadovii*, Murray (which is even more abundant in some parts of India) is identical with *H. brookii*, Gray. I must express my personal obligations to Mr. Boulenger for examining certain Geckos about the correct identifications of which I was doubtful, notably the specimens on which the form *Gymnodactylus consobrinoides* is founded.

GECKONIDÆ.

Alsophylax pipiens (Pall.)

Gymnodactylus microtis, Blanford, *J.A.S.B.* XLIV (2), 1875, p. 193; and *2nd. Yark. Miss., Rept.*, p. 15, pl. ii, fig. 1.
Alsophylax pipiens, *Boulenger*, *Cat. Liz. Brit. Mus.* i, p. 19.

Dr. Blanford does not record this species from Ladak, though it appears to be common in Eastern Turkestan; but there is a specimen in the Museum (from Stoliczka's Yarkand collection), which bears a label corresponding to the locality "Kharbu, Ladak" in the register. By some error this individual is entered as *Gymnodactylus stoliczkæ*—a species so distinct from *A. pipiens* that it is hardly probable that any confusion can have been made between them. It is possible, however, that some accidental exchange of labels may have taken place, and the latter species must be recorded as belonging doubtfully to the fauna of British India. It is desirable, if it does occur in Ladak, that further specimens should be obtained. They are easily recognizable on account of the extremely small size of the ear-opening.

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[1] Its locality is given as Queensland.

Distribution.—Turkestan; Transcaspia.

GYMNODACTYLUS OLDHAMI, Theob.

G. oldhami, *Theobald, Cat. Rept. Brit. Ind.*, p. 81. *Boulenger, Faun. Ind., Rept.*, p. 38.

The Indian Museum possesses the type and three other specimens of this Gecko. Except the type, they are from Lower Burma ("Tavoy," "Mintao," and "Tenasserim Expedition"); while the type is recorded as from S. Canara. This locality is more than doubtful. It was merely suggested to Theobald (*loc. cit.*) by Beddome, who did not take the species himself in South India.

Boulenger's "keys" in the "Fauna of India" and the "Catalogue" hold good for *G. oldhami*, *G. fasciolatus* and *G. variegatus*, the types of all of which are in the Indian Museum but have lately been examined by him.

GYMNODACTYLUS MARMORATUS, Gray.

G. marmoratus, *Boulenger, Cat. Liz. Brit. Mus.* i, p. 44.

The Museum has lately received specimens of this species from the Malay Peninsula in exchange with the Selangor State Museum. It is to be hoped that it will be sought for in Lower Burma.

GYMNODACTYLUS CONSOBRINOIDES, nov.

The description is based on two male specimens, both probably immature, obtained in Tavoy a number of years ago by one of the Museum collectors.

Diagnosis.—A form closely allied to *G. pulchellus* and the Bornean species *G. consobrinus*. There is no trace of a præanal groove; probably the adult male has an almost straight series of præanal and femoral pores, uninterrupted in the middle line and numbering about 26; in the young male these are represented by depressions in a row of enlarged scales. The dorsal tubercles are smaller than in *G. pulchellus* and less distinctly keeled; the ventrals are larger; the ventral region is not marked off by a line of enlarged tubercles; the plates on the ventral surface of the tail are not separated from the scales of the sides, as they are in *G. pulchellus*, by heterogeneously shaped, slightly enlarged scales. The head is very slightly depressed in the frontal region. In the types the colours have faded; the dorsal surface is dirty grey-brown, with nine darker cross-bars, edged with dirty white, on the body, and ten or eleven on the tail; on the body they are considerably narrower than the interspaces, but on the tail they become gradually broader from before backwards; the enlarged dorsal tubercles are pale; the lower surface is dirty pale brown.

Measurements (Immature male).

Total length	112 m.m.
Body	36 ,,
Tail	62 ,,
Head	14 ,,
Breadth of head	9 ,,
Fore-limb	15 ,,
Hind limb	24 ,,

I have not been able to compare the specimens with examples of *G. consobrinus*; but Mr. Boulenger regards them as representing a species intermediate in some respects between *G. pulchellus* and *G. consobrinus*. On the whole, the points in which they differ from the former seem to tend rather in the direction of the latter's characteristic peculiarities.

GONATODES ANDERSONII, Annand. (Plate II, fig. 3).

G. andersonii, *Annandale*, *J.A.S.B.* (2) suppl., 1904, p. 21.

Since the description of this form was written two additional specimens, both from Narcondam, have been presented to the Museum by Mr. C. G. Rogers. They agree well with the types and differ in the same respects as they do from *G. kandianus* and *G gracilis*. On the whole they show that the Andaman (or Narcondam?) form is undergoing what is probably a parallel evolution to that which has produced *G. gracilis*.

PHYLLODACTYLUS BURMANICUS, Annand. (Plate, I, fig. 1).

P. burmanicus, *Annandale*, *Ann. Mag. N. H.* (7) XV, 1905, p. 28.

Since I described this species another specimen, from the same locality and collection, has been found in the Museum. It is also a male. The proportions of the head differ somewhat from those of the type, so that these cannot any longer be considered as specific characters. The number of lamellæ under the fourth toe is smaller than in *P. siamensis*, being 8 or 9 in the specimens examined (see figs. 1b, 2*a*, Pl. I).

The possession by the males of this species and of *P. siamensis*, Blgr., of præanal pores marks the two forms off as constituting a very distinct section of the genus *Phyllodactylus*, if not a separate genus. I take this opportunity to figure certain structural details, as *P. europæus* is the only other species of which I have examined specimens. *P. siamensis* and *P. burmanicus* are the only forms known from the Indian Region.

HEMIDACTYLUS TRIEDRUS (Daud.) (Plate II, fig. 2).

H. subtriedrus, *Stoliczka*, *J.A.S.B.*, XLI (2), 1872, p. 93.

H. triedrus, *Boulenger*, *Cat. Liz.* i, p. 133, and *Faun. Ind.*, *Rept.*, p. 89. Annandale, *Ann. Mag. N. H.* (7) XV, p. 30.

There is a fair series of this Gecko in the Indian Museum, but unfortunately most of the specimens are without localities. One labelled "near Ellore" and named, apparently by Stoliczka, *Hemidactylus subtriedrus*, agrees closely with Jerdon's description of that species, which, however, is not definitive. It agrees with Boulenger's definition of *H. subtriedrus* in having ten labials, a head more depressed than that of typical specimens of *H. triedrus* and rather smaller ventral scales; but it differs in having only seven infradigital lamellæ under the thumb, nine under the middle finger, and nine under the middle toe. It may, therefore, be regarded as intermediate between the two forms. The fact that it is from the Ellore district suggests the possibility that other specimens of an intermediate character occur and that *H. subtriedrus* is not specifically distinct. Possibly it is one of the two specimens referred to by Stoliczka in the reference quoted; but it is not the one figured. Its donor's name was originally omitted in the Museum register, but "Dr. Stoliczka" has been written in in pencil at a later date.

HEMIDACTYLUS KARENORUM (Theob.)

A specimen from Cachar, Assam (*Wood-Mason*). Previously known from Pegu.

LEPIDODACTYLUS CEYLONENSIS, Blgr.

Specimens from "Hills between Burma and Siam" and from Tavoy (Museum collector).

LIST OF GECKOS FROM SINKIP ISLAND.

The following species were taken on Sinkip Island, which lies some little distance off the east coast of Sumatra, by the late Prof. J. Wood-Mason's collector:—

1. *Gymnodactylus feæ*, Blgr. (3 specimens).
2. *Hemidactylus frenatus*, Gray (numerous specimens).
3. *Hemidactylus platyurus* (Schneid.) (numerous specimens).

EUBLEPHARIDÆ.

Eublepharis hardwickii, Gray

I find it hard to ascertain the exact range of this somewhat rare species. The Museum has specimens from the following localities:—Quetta; Khorda, Orissa; Ganjam; the Sunderbans, near Calcutta. Very few of the Indian lizards are found both in Baluchistan and Lower Bengal.

AGAMIDÆ.

Pyctolæmus gularis, Ptrs.

A male from Goalpara, Assam (*H. L. Houghton*).

The male differs from the female only in the development of the gular pouch, which commences in a vertical line with the centre of the eye and terminates behind at the anterior border of the shoulder girdle. It can be folded into the surface of the throat so as to be very inconspicuous, but is evidently capable of great distention; the three pairs of gular folds which characterize the female are well marked on its sides. Its general colour is black, but these folds and the lower border are dirty white: the specimen, however, is much faded.

Acanthosaura lamnidentata, Blgr.

A lamnidentata, *Boulenger, Faun. Ind. Rept.*, p. 126; and *Ann. Mus. Geneva* (2) xiii, p. 317.

Coloration is no guide in the identification of this species. Specimens of *A. lamnidentata*, *A. armata* and *A. crucigera*, may all be coloured[1] (at any rate if faded) exactly alike, as the series in the Museum shows. This series bears out Boulenger's contention, that the relative length of the superciliary spine affords a constant distinction between *A. lamnidentata* and *A. crucigera*, though the two forms are otherwise practically identical. In *A. armata* the spine is considerably longer than in either.

The Museum possesses characteristic specimens of *A. armata* from "Burma" (*Major Berdmore*) and from Mergui (*Anderson*). The latter is the one recorded in the *Fauna of Mergui*, i, p. 343.

Japalura andersoniana, nov. (Plate II, fig. 4).

This species is founded on two male specimens collected by Col. Godwin-Austen in the Duffla Hills (Assam-Bhutan Frontier). The late Dr. J. Anderson recognised it as new, but neither gave it a name nor described it.

Diagnosis.—Body rather slender, strongly compressed; hindlimb long, reaching to the tip of the snout or beyond. Snout slightly longer than the diameter of the orbit, obtuse; rostral and superciliary ridge prominent, continuous; the latter succeeded behind, after an interval, by a large conical tubercle, round which several others of smaller size are grouped. There are two other prominent tubercles between the top of the head and the tympanic region on each side. A curved line of smaller tubercles outlines the inner margin of the superciliary region and a flat or slightly depressed sub-circular area is similarly marked off on the snout. All the scales are keeled; those on the sides are small, with five oblique rows of larger and more prominent scales running downwards and forwards from the base of the dorsal crest to or beyond a longitudinal line of similar scales; between every two of these rows there is another, which is much shorter and does not reach as much as half way down the body. The dorsal surface of the limbs is covered with rather large heterogeneous scales, the larger of which show a tendency to be arranged in V-shaped series; the scales on the belly and ventral surface of the limbs are larger than those on the sides; the tail is covered with small, imbricate, leaf-shaped scales, which are not enlarged below. The nuchal crest is well developed (in the male), consisting of a fold of skin covered with three or four parallel horizontal rows of flat, smooth scales, the uppermost of which are larger than those below them and form a feebly serrated ridge; the dorsal crest is much lower, consisting of a single row of similar scales. There is no gular pouch and no distinct gular fold.

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[1] But compare my note in *Fascic. Malay.—Zool.* 1, p. 154.

Coloration—Dorsal surface dirty brown, rather dark, brighter on the head, feebly marbled on the sides, pale on the ventral surface; pale, dark-edged lines radiating from the eyes.

Measurements ♂.

Total length (tip of tail injured) ...	119 mm.
Head	20 ,,
Width of head	11 ,,
Body	33 ,,
Fore-limb	29 ,,
Hind limb	52 ,,

This species can be distinguished easily from *J. planidorsata* by its compressed body and long hind limbs.

SALEA HORSFIELDII, Gray

Specimens from Moulmein (*Stoliczka*) and from "Hills near Harmatti, Duffla Expedition" (*Godwin-Austen*).

CALOTES MICROLEPIS, Blgr.

Of this species, previously known from the hills of northern Tenasserim, the Museum possesses a specimen from Manipur (*R. D. Oldham.*)

CALOTES VERSICOLOR (Daud).

C. gigas, *Blyth*, *J.A.S.B.* XII, 1853, p. 648.

C. gigas (*under* C. mystaceus), *Boulenger*, *Faun. Ind.*, *Rept.* p. 138. C. versicolor *id.*, *op. cit.*, p. 135.

I have examined several hundred specimens of this common lizard. They came from nearly all parts of India and Ceylon, from Malaya and Pitsanuloke in Siam. With these I have compared Blyth's types of *C. gigas* (which are in the Indian Museum), with the result that I find the two forms to belong clearly to the same species. There is no oblique fold in front of the shoulder in Blyth's specimens, and therefore they cannot be associated with *C. mystaceus*, as Boulenger, who had had no opportunity of examining them, thought probable.

The types of *C. gigas*, which are adult males, differ from the majority of specimens only in having the secondary sexual characters more fully developed ; the scales (especially those on the throat) are heavily keeled and inclined to be lanceolate in outline, the crest is very high, the cheeks are greatly swollen, the size above the average. The large series examined shows that in Lower Bengal (and probably in Assam, Burma and Malaya), the males of *C. versicolor* rarely if ever reach an extreme degree of development in these respects ; but no exact line can be drawn. We have specimens from Sind, from South and North-West India and from Ceylon which agree almost exactly with Blyth's, while a much larger number are intermediate in character. Dr. Blanford's examples from Baluchistan (*Eastern Persia* ii, p. 313) belong to this intermediate phase ; but specimens from Calcutta have the male characters even less marked. The extreme phase (*gigas*) probably bears much the same relation to *versicolor* as *Gonyocephalus humii* (Blyth) does to *G. subcristatus* (Stol).

CALOTES YUNNANENSIS. nov.

C. maria (*part.*), *Anderson*, *Anat. Zool. Res. Yunnan Ex.*, p 806.

Among the lizards collected by Dr. Anderson in Yunnan I find a *Calotes* which does not agree with any published description. It is registered in the Museum books as *C. maria* and is the only specimen from Yunnan now in the collection which at all resembles this species. It differs, however, in certain respects from the descriptions and from specimens from Assam, and I think that (in the present state of systematic nomenclature) it is worthy of a specific name. Anderson states that the specimens of *C. maria* which he took in Yunnan were compared with the types of the species ; but what has become of the rest of them I have been unable to discover. As regards several important points the new form is intermediate between *C. maria* and *C. jerdonii* ; but it has a distinct though rather short and shallow oblique fold in front of the shoulder covered with granular scales. Were it not that the presence or absence of such a fold is a very constant character in other members of the genus, the specimen would practically break down the distinction between the two species, or would have to be regarded as an aberrant example of *C. mariæ*.

Diagnosis.—Upper head scales moderate, smooth, imbricate, slightly enlarged on the superciliary area; two parallel rows of enlarged, erect scales on the temple, the posterior few of each series ending in short spines; the lower series is separated from the tympanum (in the type) by three rows of small scales. Tympanum nearly half the diameter of the orbit. Gular pouch not developed; gular scales strongly keeled, larger than ventrals, equalling dorsals. A rather short and shallow oblique fold in front of shoulder; dorso-nuchal crest well developed anteriorly, the longest spines (just behind the head) measuring between half and two-thirds the diameter of the orbit. Fifty-six scales round the centre of the body; dorsal and lateral scales feebly keeled, directed upwards and backwards; ventrals much smaller than dorsals, strongly keeled. The adpressed hind limb reaches the anterior border of the orbit; third and fourth fingers nearly equal. Tail round, slender, very long. Colour green (faded in the type), with pale (red ?) markings on the sides and on the knees and elbows.

Measurements ♂.

Total Length	...	...	405 Mm.
Head ...	...	...	34 ,,
Width of head	...	...	17 ,,
Body ...	...	...	65 ,,
Tail ...	...	...	305 ,,
Fore-limb ...	...	...	53 ,,
Hind limb ...	...	...	68 ,,

CALOTES ROUXII, D & B.

C. rouxii, *Boulenger, Faun. Ind., Rept.*, p. 142.
Several specimens from Travancore (*Beddome*).

AGAMA MEGALONYX (Gthr.)

A. megalonyx, *Boulenger, Cat. Liz.*; i. p. 347.
Two specimens from the Perso-Baluch frontier (*Dr. Turnbull* and *Col. Wahab*).

AGAMA LIRATA (Blanf.)

A. lirata, *Boulenger, Faun. Ind., Rept.*, p. 150.
Four specimens from Sind (*Murray ?*) agree very closely with the type, which is in the Indian Museum. Probably this species does not reach the full dimensions of *A. melanura*; its tail is more slender and proportionately longer.

AGAMA. sp.

There are two specimens of a large *Agama* in the collection which represent a species allied in some respects to *A. nupta*, De Fil. As their origin is uncertain I prefer to leave them unnamed. The numbers on their museum labels have been originally entered in the register without particulars, but "Dr. W. T. Blanford. Persian collection ?" has been written in at a later date in pencil and the collector's labels attached to them resemble those of the Persian Collection.

They differ from specimens of *A. nupta* (of which I have examined a large series) chiefly in the character of their dorsal lepidosis. There is along the vertebral line a narrow band of enlarged scales which widens slightly from before backwards. These scales are not homogeneous or arranged in any order, but differ largely *inter se* both in size and in development; they are strongly mucronate and their bases do not overlap; some of them have almost the character of retroverted spines. Similar scales are scattered on the sides of the posterior part of the body, and there are others, which have a rather larger base, on the postero-lateral surface of the thighs. The majority of the dorso-lateral scales are extremely minute, but the antero-lateral scales of the thighs are large, imbricating, leaf-shaped, homogeneous and strongly keeled. The other characters are those of *A. nupta*.

AGAMA NUPTA, De Fil.

A. nupta, *Boulenger, Faun. Ind. Rept.*, p. 151. *Alcock* and *Finn, J.A.S.B.* lxv (2), 1896, p. 555.

The verticillation of the tail, at any rate in old specimens, may be practically absent. The coloration is frequently an almost uniform brownish-black. The Museum processes a characteristic but imperfect specimen from Chitral (*Dr. G. M. Giles*)

LIOLEPIS BELLII (Gray)

L. bellii, Boulenger, Fascic. Malay. Zool. 1, p. 155. *Annandale* and *Robinson*, *ibid.* (note). *Annandale*, *P. Z. S.*, 1900, p. 857, and *Ann: Mag. N. H.* (7) XV, 1905, p. 32.

We have several immature specimens from Burma which exhibit the characteristic "juvenile livery" so well marked in examples from the Malay Peninsula.

LIST OF AGAMIDÆ TAKEN ON SINKIP ISLAND BY WOOD-MASON'S COLLECTOR.

1. *Draco quinquefasciatus* (Gray) (numerous specimens).
2. *Aphaniotis fusca* (Ptrs.) (one specimen).
3. *Calotes jubatus* (D. & B.) (one specimen).

ANGUIDÆ.

OPHISAURUS APUS (Pall.)

The known range of this species is from Dalmatia to Afghanistan, from near the Indian border of which we have a specimen; but it probably occurs also in adjacent parts of India. There are several specimens in the Indian Museum which have come from the Alipore Zoological Gardens, unfortunately without any definite history; but the probability is that they are from North-Western India.

OPHISAURUS GRACILIS (Gray)

Of *O. gracilis* the Museum possesses a large series, which exhibits great variation as regards colour. Judging from a collection recently made by Major Alcock, this species is common near Darjeeling. Major Alcock tells me that it is extremely sluggish and generally " shams dead " when handled.

VARANIDÆ.

VARANUS DUMERILII (Müll.)

The only specimen we possess is immature, being the type of Blanford's *Varanus macrolepis*. It is very desirable that further examples should be obtained, as the other Indian species of the family are represented by large series.

LIZARDS OF INDIA, BURMA AND CEYLON.[1]

GECKONIDÆ.

1.	Teratoscincus scincus* (Schleg.)	(Alcock and Finn, *J.A S.B.*, 1896.) Baluchistan.
2.	Ceramodactylus affinis, Murray*	(*iid, ibid.*) Baluchistan.
3.	Stenodactylus orientalis, § Blanf.	Sind.
4.	*Stenodactylus lumsdenii*, Blgr.	Baluchistan.
5.	Alsophylax pipiens * (Pall.) ?	Ladak ? (*Antea.*)
6.	,, tuberculatus, § (Blanf.)	Sind, Baluchistan.
7.	Gymnodactylus fedtschenkoi, Strauch.	Panjab Salt Range.
8.	Gymnodactylus scaber (Rüppl.	Sind.
9.	,, brevipes, § Blanf.	Baluchistan.
10.	,, kachensis, § Stol.	Katch; Baluchistan; Sind.
11.	,, stoliczkæ, Steind.	Upper Indus Valley.
12.	,, lawderanus, § Stol.	Almorah and Kumaun.
13.	,, nebulosus, Bedd.	S. India and Ceylon.
14.	*Gymnodactylus jeyporensis*, Bedd	Jeypore.
15.	,, *deccanensis*, Gthr.	Bombay Presidency.

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[1] A * denotes an addition to the Indian fauna since 1890; a § that a type or co-type is in the Indian Museum. The names of species not represented in this collection are printed in italics.

16.	*Gymnodactylus albofasciatus*, Blgr.	S. Canara.
17.	Gymnodactylus oldhami, § Theob.	Lower Burma.
18.	,, triedrus, Gthr.	Ceylon.
19.	,, frenatus, Gthr.	,,
20.	,, khasiensis § Jerd.	Assam; Upper Burma.
21.	,, rubidus, § (Blyth.)	Andamans.
22.	*Gymnodactylus peguensis*,* Blgr.	(Boulenger, *Ann. Mus. Genova* (2) xiii.) Pegu.
23.	Gymnodactylus pulchellus (Gray).	Bengal (?); and Lower Burma.
24.	,, consobrinoides,*§ Annand.	Tavoy. (*Antea.*)
25.	,, variegatus § (Blyth).	Lower Burma.
26.	,, feæ, * Blgr.	(Boulenger, *op. cit.*), Pegu.
27.	,, fasciolatus§ (Blyth.)	Western Himalayas.
28.	Agamura cruralis, § Blanf.	Baluchistan.
29.	,, persica * (A. Dum.)	(Alcock and Finn, *op. cit.*) Baluchistan.
30.	Pristurus rupestris, § Blanf.	Sind; Central India (?)
31.	Gonatodes indicus (Gray)	Nilgiris, S. India.
32.	,, wynadensis (Bedd.)	Wynaad ,, ,,
33.	*Gonatodes sisparensis* (Theob.)	Nilgiris ,, ,,
34.	Gonatodes ornatus (Bedd.)	Malabar.
35.	,, marmoratus (Bedd.)	Malabar District.
36.	,, mysoriensis (Jerd.)	Mysore.
37.	,, kandianus (Kelaart.)	Ceylon; S. India, and Preparis I.
38.	,, andersonii, * § Annand.	(Annandale, *J.A.S.B.*, (2) suppl. 1904) Andamans.
39.	,, gracilis (Bedd.)	Ceylon and S. India.
40.	,, jerdonii (Theob.)	,, ,, ,,
41.	,, littoralis (Jerd.)	Malabar District.
42.	Phyllodactylus burmanicus,*§ Annand.	(Annandale, *Ann. Mag. N.H.*, 1905), Tavoy.
43.	Callodactylus aureus, Bedd.	N. Arcot.
44.	Ptyodactylus homolepis, § Blanf.	Sind and Baluchistan.
45.	Hemidactylus reticulatus, Bedd.	S. India.
46.	,, gracilis, § Blanf.	Central Provinces.
47.	,, frenatus, D. & B.	S. and E. India; Burma; Ceylon.
48.	,, brookii, Gray.	(=H. gleadovii, Murray.) All India and Ceylon.
49.	,, turcicus (Linn.)	Sind.
50.	,, persicus, § Anders.	,,
51.	,, maculatus, D. & B.	Deccan and S. India.
52.	,, triedrus (Daud.)	Central and S. India; Ceylon.
53.	*Hemidactylus substriedrus*, Jerd.	S. India.
54.	Hemidactylus subtriedroides,*§ Annand.	(Annandale, *op. cit.*), Upper Burma.
55.	,, depressus, Gray.	Ceylon.
56.	,, leschenaultii, D. & B.	All India, Burma (?) and Ceylon.
57.	,, flaviviridis, Rüpp.	(=H. coctæi, D. & B.), All India.
58.	,, giganteus, § Stol.	Malabar district.
59.	,, bowringii (Gray)	E. India and Burma.
60.	,, karenorum (Theob.)	Pegu; Cachar.
61.	,, garnotii, D. & B.	Sikhim and Burma.
62.	,, platyurus (Schneid.)	E. India; Burma and Ceylon.
63.	Teratolepis fasciata,§ Blyth.	Deccan and Sind.
64.	Gehyra mutilata (Wiegm.)	N.E. India; Burma and Ceylon.
65.	Lepidodactylus ceylonensis, Blgr.	Burma and Ceylon.
66.	,, aurantiacus (Bedd.)	S. India.
67.	,, lugubris (D. & B.)	Burma and Ceylon; Andamans and Nicobars.

68.	*Hoplodactylus duvaucelii* (D. & B.)	Bengal (?)
69.	Hoplodactylus anamallensis (Gthr.)	Anamallays, S. India.
70.	Gecko verticillatus, Laur.	N.E. India; Burma.
71.	,, stentor (Cant.)	Chittagong, Burma; Andamans and Nicobars.
72.	,, monarchus (D. & B.)	Ceylon.
73.	Ptychozoon homalocephalum (Crev.)	Lower Burma; Andamans (?) and Nicobars.
74.	Phelsuma andamanense § (Blyth.)	Andamans.

EUBLEPHARIDÆ.

75.	Eublepharis hardwickii, (Gray.)	Peninsular India; Baluchistan.
76.	,, macularius, § Blyth.	Punjab and Sind; Chitral.

AGAMIDÆ.

77.	Draco maculatus (Gray.)	Assam and Burma.
78.	,, blanfordii, Blgr.	Tenasserim.
79.	,, norvillii, *§ Alc.	(Alcock, (2) *J.A.S.B.* LXIV.) Upper Assam.
80.	,, dussumieri, D. & B.	Malabar Coast.
81.	,, tæniopterus, Gthr.	Tenasserim.
82.	Sitana ponticeriana, Cuv.	India and Ceylon (not in Himalayas).
83.	Otocryptis bivittata, Wiegm.	Ceylon.
84.	*Otocryptis beddomii*, Blgr.	S. India.
85.	Ptyctolæmus gularis, Ptrs.	Assam.
86.	Cophotis ceylanica, Ptrs.	Ceylon.
87.	Ceratophorus stoddartii, Gray.	Ceylon (mountains only.)
88.	,, tennentii, Gthr.	Ceylon.
89.	,, aspera, Gthr.	Ceylon.
90.	Lyriocephalus scutatus (Linn.)	Kandy district, Ceylon.
91.	Gonyocephalus subcristatus (Blyth.)	Andamans and Nicobars.

[G. humii (Stol.) = G. subcristatus (aged individuals), Annandale, *J.A.S.B.* (2), 1904, suppl.]

92.	*Gonyocephalus bellii* (D. & B.)	Bengal.
93.	,, *grandis* (Gray.)	Pegu.
94.	Acanthosaura armta (Gray)	Burma.
95.	,, crucigera, Blgr.	Tenasserim.
96.	,, lamnidentata, Blgr.	Lower Burma.
97.	*Acanthosaura minor* (Gray.)	Sikhim and Assam.
98.	,, *kakhiensis* (Anders.)	(= Calotes feæ, Blgr.) Burma.
99.	Acanthosaura major (Jerd.)	W. Himalayas.
100.	,, tricarinata § (Blyth.)	Sikhim.
101.	Japalura andersoniana, *§ Annand.	(*Antea*), N.E. Assam.
102.	,, variegata, Gray	Sikhim, Assam and Bengal.
103.	,, planidorsata, Jerd.	Assam; Sikhim.
104.	Salea horsfieldii, Gray	S. India; Ceylon (?); Burma; N. E. Assam.
105.	,, anamallayana (Bedd.)	Animalay and Patni Hills, S. India
106.	Calotes microlepis, Blgr.	Lower Burma; Manipur.
107.	,, cristatellus (Kuhl.)	Tenasserim.
108.	,, jubatus (D. & B.)	Nicobars.
109.	,, versicolor (Daud.)	All India, Burma and Ceylon.

[C. gigas, Blyth = C. versicolor (Daud.)]

110.	Calotes maria, Gray	Assam.
111.	,, jerdonii, Gthr.	,,
112.	,, emma, Gray	Burma and Assam.

113.	Calotes mystaceus, D. & B.	S. India, Ceylon, Andamans and Nicobars.
114.	*Calotes grandisquamis*, Gthr.	Malabar.
115.	Calotes nemoricola, Jerd.	Nilgiris; Malabar.
116.	*Calotes ceylonensis* (F. Müller)	Ceylon.
117.	Calotes liolepis, Blgr.	,,
118.	*Calotes andamanensis*,* Blgr.	(Boulenger, *Ann. Mag. N.H.*, 1891) Andamans.
119.	Calotes ophiomachus (Merr.)	Ceylon; S. India; Nicobars.
120.	,, nigrilabis, Ptrs.	Ceylon.
121.	*Calotes liocephalus*, Gthr.	,,
122.	Calotes rouxii, D. & B.	Bombay Presidency; Travancore.
123.	,, elliotii, Gthr.	S. India.
	[Calotes feæ, Blgr. = Acanthosaura kakhiensis (Anders.)]	
124.	Charasia dorsalis (Gray)	S. India (hills).
125.	,, blanfordiana, Stol.	Central India.
126.	,, ornata (Blyth)	Central and North-Eastern India.
127.	Agama isolepis, Blgr.	N.W. India.
128.	,, rubrigularis § (Blanf.)	Sind.
129.	,, megalonyx * (Gthr.)	Baluchistan (*Antea*).
130.	,, tuberculata, Gray	Kashmir and W. Himalayas.
131.	,, dayana (Stol.)	Foot of W. Himalayas.
132.	,, himalayana (Steind.)	Upper Indus Valley.
133.	,, agrorensis § (Stol.)	N. W. India (high altitudes).
134.	,, melanura (Blyth)	Sind; Panjab; W. Himalayas.
135.	,, lirata§ (Blanf.)	Sind; Baluchistan.
136.	,, nupta, De Fil.	,, ,, ; Chitral.
137.	,, caucasica (Eichw.)	Baluchistan.
138.	Phrynocephalus olivierii, D. & B.	Baluchistan.
139.	,, theobaldi, Blyth	Upper Indus Valley.
140.	,, caudivolvulus (Pall.)	Ladak.
141.	,, ornatus, Blgr.	N. Baluchistan.
142.	,, maculatus, Anders.	,, ,,
143.	,, euptilopus, *§ Alc. & Finn	,, ,, [Alcock and Finn. *op. cit.*]
144.	,, luteoguttatus, Blgr.	,, ,,
145.	Liolepis bellii (Gray)	S. India; Burma.
146.	Uromastix hardwickii, Gray	N. W. India.
147.	,, asmussii* (Strauch)	Baluchistan [Alcock and Finn, *op. cit.*].

ANGUIDÆ.

148.	Ophisaurus gracilis (Gray)	N.E. India; Sikhim; Assam Upper Burma.
149.	,, apus * (Pall.)?	N.W. India? (*Antea.*)

VARANÆ.

150.	Varanus griseus (Daud.)	N.W. India (deserts).
151.	,, flavescens (Gray)	N. India; Burma.
152.	,, bengalensis (Daud.)	Peninsular India and Ceylon; Burma?
153.	,, nebulosus (Gray)	Central Provinces (?); Bengal; Burma.
154.	,, dumerilii (Müll.)	Tenasserim.
155.	,, salvator (Laur.)	N. E. India; Ceylon; Burma Andamans and Nicobars.

(*To be continued.*)

9. *Archæologisch Onderzoek op Java en Madura. I Beschrijving van de ruïne bij de Tesa Toempang, genaamd Tjandi Djago. Batavia, 1904.—By* FATHER DAHLMANN, S.J. *Communicated by the Philological Secretary.*

A magnificent volume of Archæological research has lately been presented to the Asiatic Society by the Batavian Society of Letters and Arts. It is the first outcome of the researches conducted by the newly established archæological survey in the Dutch East Indies, and it treats of one of those highly interesting relics of true Indian Art, so profusely scattered over the whole ground of Middle and Eastern Java. Although I cannot claim any title to introduce to you this admirable work—yet the favourable opportunity I enjoyed of visiting Java on my way back from China and of personally examining some of its most distinguished monuments, may perhaps excuse my saying a few words about the results embodied in this volume. I am all the more anxious to do this for the Asiatic Society in that it was a distinguished English statesman and administrator in the Far East, who gave us the first accurate and scientific knowledge of the monumental antiquities of Hindoo civilization in Java. I refer to Sir Thomas Stamford Raffles, Governor General of Java and its dependencies. This distinguished member of the Asiatic Society, inspired by that high enthusiam for Indian research which led to so many discoveries, revealed to us for the first time a new world of Indian art in his masterly History of Java. I say "masterly:" for when we remember that until his time nothing had been done to clear the way for the study of the relics of Hindoo Religion and Art once predominant in Java, everyone must be surprised at the vast and minute learning with which Raffles introduced into the descriptive and figurative details of research. His History of Java gave the first impulse to closer investigation of the grand monuments. But although since his time some remarkable works have been published by distinguished members of the Batavian Society, it was long before a methodical inquiry, covering the whole ground of ancient Hindoo relics, could be inaugurated—perhaps according to a German proverb, "Gut Ding hat Weile," "a good thing needs time." And indeed it is a good thing, in fact an excellent thing, which finally has been brought forth by the Archæological Survey of the Dutch East Indies under the leadership of its talented Director General, Dr. Brandes.

The volume presents to us a complete archæological picture of a Buddhist Sanctuary in Eastern Java, now-a-days called Tjandi Toempong. The monument described is neither one of the earliest nor one of the finest works produced by the Hindoo artists in Java. For the monuments erected in the Eastern Kingdoms of Hindoo Princes show, in style and workmanship, a remarkable decline from what we admire in the artistic beauty developed at a much earlier period in Central Java. If we look for the monuments of the classical period, we must turn our eyes to Boro-Bodur and to Prambanam. We might have perhaps expected that the systematic research now inaugurated would begin with those masterpieces of art. The survey has taken a contrary course, beginning with Eastern Java, where art was in its decline and leading investigation from the latest relics of true Indian art to the earliest and at the same time the most glorious representatives of Indian workmanship.

I say "true Indian art." For when you go through the splendid photo-series illustrating this volume, you will immediately be impressed by the truly Indian character of the ornament. This is not only the case with the decorative ornament in general. The true Indian character shines forth above all in the sculpture cycles decorating the terraces of the monument. It was one of the characteristic features of the Hindoo artists in Java, that they decorated the walls not only with detached sculptures and statues, but with a continuous line of scenes representing a whole cycle of legends. They reached their highest perfection in the sculpture cycles of central Java. At the Brahmanical sanctuary of Prambanam the legend of the Ramáyana is worked out in a splendid set of reliefs. But in the Buddhist sanctuary of Boro Bodur we have the whole legend of the life of Buddha as told in the Lalitavistara, put before our eyes within the frame of more than sixty reliefs. Another series of sculptures represents in continuous line more than thirty Jatakas, that is to say, more than all the Buddhist monuments of India proper and of Afghanistan together contain. Besides there is another sculpture cycle of more than sixty highly-refined reliefs, of which the meaning has not yet been discovered. We meet with the same characteristic feature in the monument described in the present volume.

The Sanctuary is mounted on a threefold terrace, one terrace rising above the other. The walls of every terrace have their peculiar cycle of legends. In the first terrace we meet with a set of legends evidently taken from the fables of the Pancatantra; the reliefs of the second terrace represent scenes of the Rāma legend; those of the third terrace give the Arjunavivāha and especially Arjuna's fight with Çiva; finally the walls of the Sanctuary itself are decorated with scenes of the Kṛishṇa legend. So we see here united within the architectural limits of a small sanctuary a good number of favourite topics of Hindoo epic poetry.

Now as regards artistic workmanship the sculpture-cycles of Tjandi Toempang are, as I have already pointed out, far inferior to those found in Central Java. For comparison's sake I have laid before you a few of my own photos, representing scenes of the sculpture cycles either of Boro-Bodur or of Prambanam. Nay, the artistic value of our Tjandi must be held even much inferior to the reliefs of Panataran, lying in the same region of Eastern Java.

But it is not the artistic value, which gives to the sculpture-cycles here represented their importance. This is to be sought for in quite another line of comparison.

The artists of the classical period of Hindoo art in Java closely followed the original Sanscrit texts when representing their legendary objects. The legends, as told either in the original Rāmāyana and Mahābhārata or in the original Lalitavistara, were the models put before the eyes of the workmen of Central Java. In Eastern Java, on the contrary, it is no longer Hindoo epic poetry as contained in the original epic, but Hindoo poetry remodelled in the old Javanese Kavi translation. The scenes of the first terrace, although closely resembling some legends of the Pancatantra, follow the old Javanese Tantra, which itself is based on the original Pancatantra or on the Hitopadeça. The cycle of the second terrace follows the Rāma legend as told in the old Javanese Rāmāyana. And so with the legend of Arjuna in the third terrace and with the Kṛishṇa legend on the walls of the Sanctuary. It is therefore as a Javanese reflex of Hindoo poetry, that is to say, as a typical old Javanese development of Hindoo thought and Hindoo life,—an outcome of that continuous Hindoo influence, spread over the country for so many centuries—that the monument before us should be viewed and a place assigned to it in the history of Indian art in Java. In these sculptures we must look therefore for the true representative of all those literary and artistic characteristics which Hindoo civilisation finally developed on Javanese ground and which, combined together, make out the proper and original type of old Javanese civilisation.

But there is yet another remarkable point to be noted in our monument; a point which is of considerable importance with regard to the religious and artistic development of Hindoo belief not only in Java but over the whole sphere of India.

Look at the decorative element of our sanctuary. You will find nothing in it indicative of a work of Buddhist devotion. The sculpture-cycles, in which Çiva plays such a remarkable part, might lead you to say that Tjandi Toempang is a monument of Çiva worship.

But this is not the case. Although the ornament is all Brahmanical and as regards the sculpture cycles rather Çivaite, the monument itself was consecrated to the worship of the five Dhyāni-Buddhas and of three Tārās or mystic powers. This becomes evidently manifest in the splendid statues representing separately the Dhyāni-Buddhas and their Tārās. And if there could be a doubt about the character of these statues, the old Nāgarī inscriptions, giving to every statue its proper signification would dispel it.

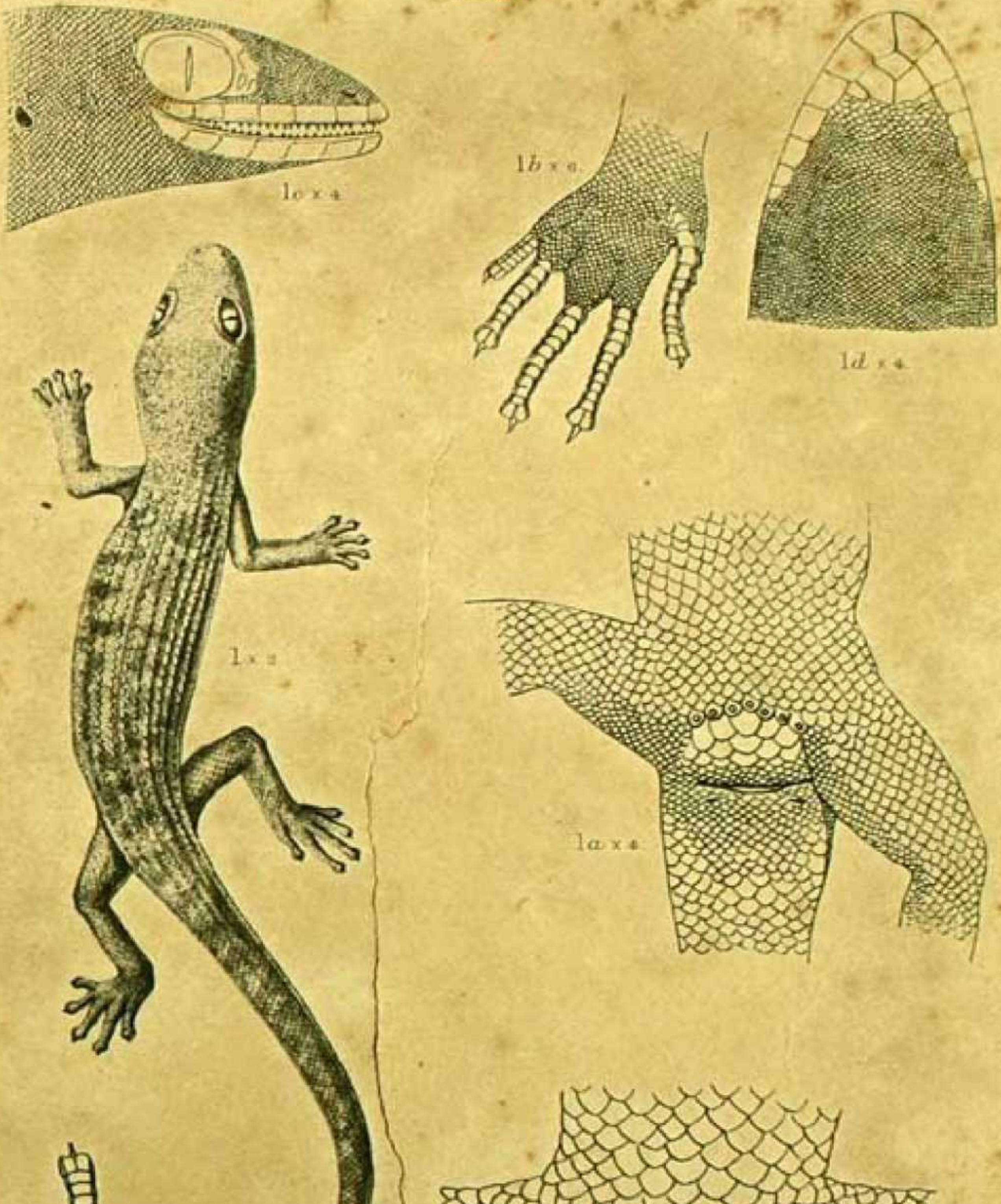
How is this fact, that is to say the close connexion of Çivaite art and Buddhistic worship, to be explained.

The foundation of the Sanctuary, according to an inscription found at Tjandi Toempong is to be assigned to the first half of the thirteenth century. Hindoo society in Eastern Java was at that time absolutely Çivaite; it had been Çivaite ever since the seventh and eight century and remained Çivaite in spite of the Buddhistic influence spreading over the country. Buddhism became in the ninth century so strong that it could give rise to monuments of such splendour as we see in Boro-Bodur and in its neigbourhood. It is as if a mighty wave of Buddhist influence had suddenly come over Hindoo civilisation, established in Java on a thoroughly Brahmanical ground, either Çivaite or Vishnuite. Later on this Buddhist wave lost its strength amidst Çivaite and Vishnuite worship, rooted deeper and spreading farther its branches amongst the Hindooised population.

But in the beginning of the thirteenth century a second wave of Buddhist influence reached Java on its eastern shore. This second wave came evidently from the south of India and gained some temporary ascendancy in the mighty kingdom of Madjapahit. That there must have been such an influence coming from the south, long ago, was pointed out by Burnell in his South-Indian Inscriptions. He found evidence of it in the close resemblance of the Nāgarī type of inscriptions we find in connexion with the statues to the Nāgarī type of South India. He was only wrong about the epoch, saying that according to the resemblance of types this influence must have been exerted in the eleventh century. The writing of the inscriptions closely resembles the Nāgarī character of the first half of the thirteenth century, which is quite in accordance with the age of the monument, as attested by the inscription of King Vishṇuvardhana. The monument described is therefore a new proof of the fact that Buddhism was yet existing in the south of India at the beginning of the thirteenth century, as in fact it existed in the north of India. But at the same time it is evident that Buddhism as developed in the Mahayāna, had entered into a close religious and artistic alliance with Çiva worship. With regard to this the Sanscrit inscription found in Kasia in the North-Western Provinces and recently interpreted by Prof. Kielhorn of Göttingen gives a striking parallel.

The inscription in the two first lines celebrates Çiva; in the third line Tārā, the Buddhaçakti is mentioned *disertis verbis*. In the fourth and fifth line Buddha is celebrated as Tathāgata and Munīndra. So we find in the north of India the same connexion of Çiva on the one side, of Buddha and its Çahti on the other side that we meet with in the eastern part of Java.

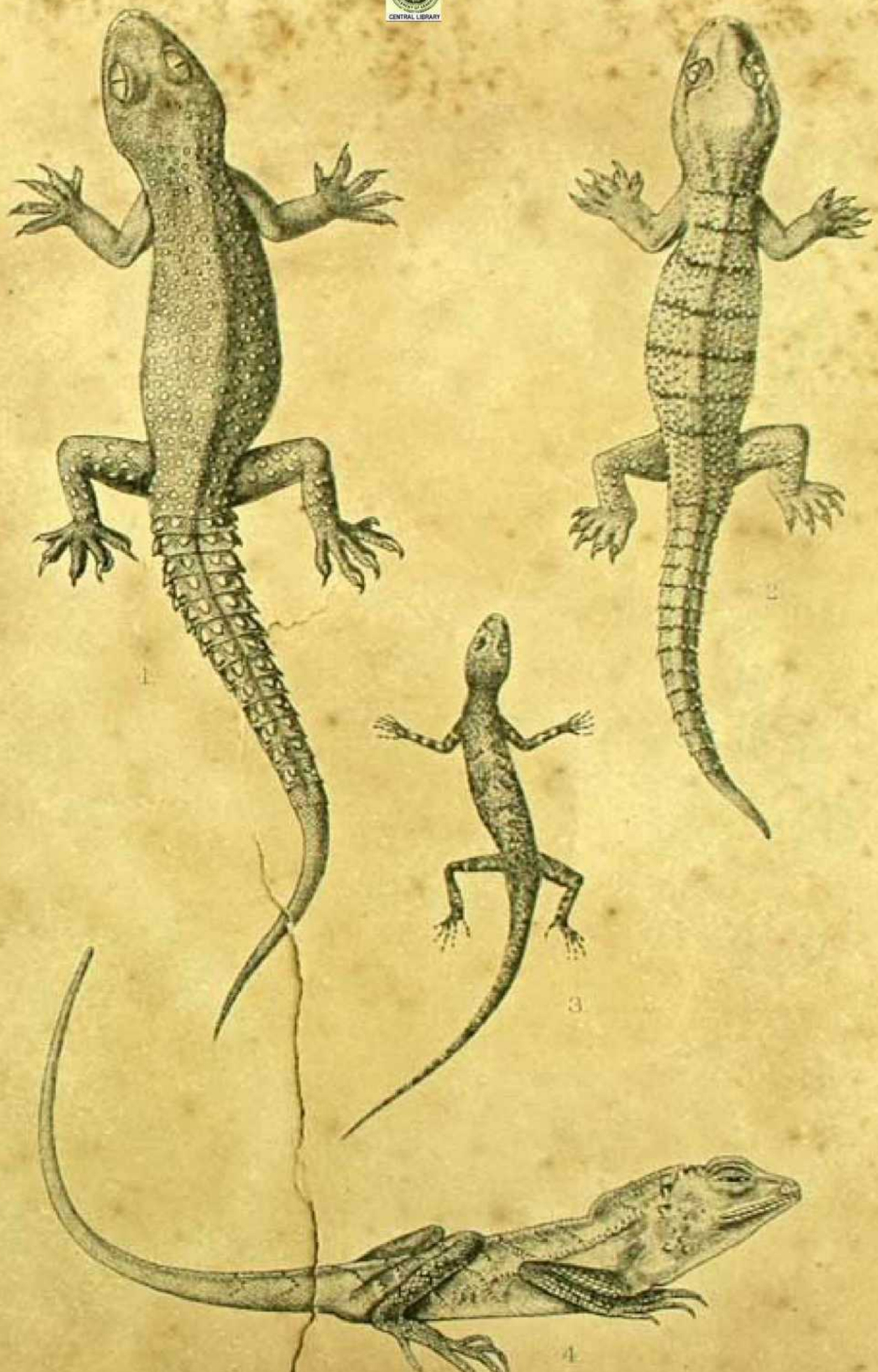
The few words I desired to say have become many. But they are, I hope, not quite out of place, since they tried to show how much light the religious and artistic development of Hindooism in Java may yet throw on the whole history of Indian religion and art. Further research may perhaps lead to the discovery of a page of the history of Indian art, lost in India proper and preserved in the Hindooised island far away.


1c × 4.
1b × 6.
1d × 4.
1 × 2.
1a × 4.
2a × 7.
2 × 4.

A.C. Chowdhary, del.

Photogravure, Survey of India Offices, Calcutta, May 1905.

1. PHYLLODACTYLUS B[illegible]ROIDEUS. 2. PHYLLODACTYLUS SIAMENSIS.



A. C. Chowdhary del.

Photogravure, Survey of India Offices, Calcutta, May [illegible]

1. HEMIDACTYLUS SUBTRIEDROIDES. 2. HEMIDACTYLUS TRIEDRUS FROM ELLORE.
3. GONATODES ANDERSONII. 4. JAPALURA ANDERSONIANA.

APRIL, 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 5th April, 1905, at 9-15 P.M.

His Honour SIR A. H. L. FRASER, M.A., LL.D., K.C.S.I., President, in the chair.

The following members were present:—

Mr. N. Annandale, Mr. R. P. Ashton, Major W. J. Buchanan, I.M.S., Major W. J. Bythell, I.A., Babu Monmohan Chakravarti, Mr. B. L. Chaudhuri, Rai Sarat Chandra Das Bahadur, Mr. Hari Nath De, Mr. L. L. Fermor, Rev. E. Francotte, S.J., Mr. N. L. Hallward, Mr. H. H. Hayden, Mr. D. Hooper, Dr. W. C. Hossack, Mr. J. Macfarlane, Mr. C. W. McMinn, Kumar Satindradeb Rai, Captain L. Rogers, I.M.S., Pandit Yogesa Chandra Sastree, Mahamahopadhyaya Haraprasad Shastri, Mr. H. E. Stapleton, Pandit Satis Chandra Vidyabhusana.

Visitors:—Mr. A. J. F. Blair, Mr. S. H. Browne, Mr. A. G. Fraser, Mr. E. H. Pascoe, Kumar Kshitendradeb Rai Mahasai, Kumar Manindradeb Rai Mahasai.

The minutes of the last meeting were read and confirmed.

Eighty-three presentations were announced.

Mr. J. M. Dunnett was ballotted for and elected an Ordinary Member of the Society.

It was announced that Lt.-Col. H. T. S. Ramsden, I.A., had expressed a wish to withdraw from the Society.

The General Secretary read the names of the following gentlemen who had been appointed to serve on the various Committees for the present year:—

Finance and Visiting Committee—

Mr. N. Annandale.
Mr. W. K. Dods.
The Hon. Mr. A. Earle.
Mr. T. H. Holland.
Mr. H. E. Kempthorne.
The Hon. Mr. Justice Asutosh Mukhopadhyaya.
Captain L. Rogers.
Dr. E. D. Ross.
Mahamahopadhyaya Haraprasad Shastri.

Library Committee—

Mr. Harinath De,
Mr. H. H. Hayden.

Mr. T. H. D. LaTouche.
Mr. C. W. McMinn.
The Hon. Mr. Justice Asutosh Mukhopadhyaya.
Dr. E. D. Ross.
Mahamahopadhyaya Haraprasad Shastri.
Mr. E. Thornton.

Philological Committee—

Babu Muralidhar Banerjee.
Babu Monmohan Chakravarti.
Mr. Harinath De.
Mr. E. A. Gait.
The Hon. Mr. Justice Asutosh Mukhopadhyaya.
The Hon. Mr. Justice F. E. Pargiter.
Dr. E. D. Ross.
Pandit Satyavrata Samasrami.
Pandit Yogesa Chandra Sastree.
Mahamahopadhyaya Haraprasad Shastri.
Mahamahopadhyaya Chandra Kanta Tarkalankara.
Dr. G. Thibaut.
Babu Nagendra Nath Vasu.
Mr. A. Venis.
Pandit Satis Chandra Vidyabhusana.

The proposed revision in Rules 5 and 7 of the Society's Rules, of which intimation had been given by circular to all resident members in accordance with Rule 64A, were brought up for discussion.

Mr. D. Hooper exhibited some peculiar knives from Nepal and Coorg.

The following papers were read :—

1. *Aniruddha Thera.—A learned Pāli author of Southern India in the 12th Century A.D.—By* PANDIT SATIS CHANDRA VIDYĀBHŪṢAṆA.

2. *The Colouring Principle of the flowers of Nyctanthes Arbortristis.—By* E. G. HILL, B.A.

3. *On some Forms of the Krīs hilt, with special reference to the Krīs tādjōng of the Siamese Malay States. With exhibition of specimens and drawings.—By* N. ANNANDALE, B.A.

This paper will be published in the Memoirs.

4. *The Monasteries of Tibet.—By* RAI SARAT CHANDRA DAS BAHADUR, C.I.E.

5. *On the occurrence of the Fresh-water Worm Chætogaster in India, with notes on the habits of a species from Calcutta.—By* N. ANNANDALE, B.A.

6. *A letter from Mr. H. Beveridge to Babu Girindra Nath Dutt on his paper on the History of the Hutwa Raj.*

I am much obliged to you for the present of your History of the Hutwa Raj. I have read it with interest. The only point on which I am capable of commenting is that relating to the time of Akbar and his father. At page 4 you speak of the last of the Lodi kings falling into the hands of Baber, the exact fact being that he was killed in battle, and the battle of "Baksar" a little lower down is a slip for the battle of Chausa (on the other side of the Ganges). Your note at pages 48 and 49 on the Hutwa Raj in the Ain Akbari should rather be the Hutwa Raj in the Ain and the Akbarnama, for the chief references to Kalyanpore and its Zemindar are in the Akbarnama. Blochmann's notes to which you refer are derived from the Akbarnama, not from the Ain. Kalyanpore is twice mentioned in the Akbarnama vol. III. One reference is at page 370 which is that mentioned by you, though I do not think the original Persian quite warrants the statement that the imperialists drove Masum K. Faroukhudi over Kalyanpore to Mahamedabad. The other reference is not mentioned by Blochmann, but is the more important of the two, for there Abul Fazl refers to Saran and the Zemindar of Kalyanpore.[1] It occurs at page 397, Vol. III, of the Bib. Ind. ed. of the Akbarnama, line three from top. After mentioning the borders of Saran on the preceding page (396) it says that a rebel named Nur Mahammed tried to take refuge with "the Zemindar of Kalyanpore" and did not succeed. This reference is in the 28th year of Akbar's reign corresponding to 1582 or 1583 and so you will see that your date of 1600 for Raja Kalyan Mall is too late by about 20 years. The Koda[2] or Konah mentioned in Jarrett II, 156, just before Kalyanpore is perhaps the Kuadi of your page 5. By the by, Masum K. Faroukhudi was afterwards secretly murdered by Akbar's orders.

7. *Festivals, Customs and Folklore of Gilgit.—By* MUNSHI GHULAM MAHOMAD. *Communicated by the Anthropological Secretary.*

This paper will be published in the Memoirs.

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[1] "I am indebted to the Asiatic Society's resident Moulvi for the following information from the Akbarnamah:—

"Noor Muhammad, the out-law. When Khani Azam Mirza Kook took post and reached the boundaries of Jaunpore, he received information that that out-law (Noor Muhammad) came from Bengal by the way of Tirhoot and made friendship with Khaja Abdul Gafoor Nagshbandi and disturbed the peace of the country and began to ravage the district of Saran, having settled at a distance of 24 miles from Tirhoot. Meanwhile the royal troops arrived at the bank of the Ganges and attempted to construct a bridge over it. Understanding this the enemy tried to take shelter under the zamindar of Kalyanpur but in vain. He was arrested at Chelaran (Champaran)."

[2] There is no doubt that "Koḍah (Gawa ?)" of Jarrett is Kuaḍi. Most of the names of the Pergs. in Saran mentioned by Abul Fazl have been misread by Jarrett. As for their correct reading cf. my notes on the Vernacular dialects of Saran in the Journal, of the Asiatic Society of Bengal, Part I, No. 3, of 1897, pp. 194-195.

G. N. DUTT.

10. *Anuruddha Thera—a learned Pāli author of Southern India in the 12th Century A.D.—By* PROF. SATIS CHANDRA VIDYĀBHŪṢAṆA, M.A.

With the rise of Buddhism the Pāli language rose to prominence in the 6th Century B.C. From that time to the close of the 1st Century B.C., that is, for nearly five hundred years, the Buddhist books including the well known Tripiṭakas, which were rehearsed in the three famous Buddhist councils, were used to be written principally in the Pāli language. But since the rise of the Mahāyāna school of Buddhism under the auspices of the fourth Buddhist Council that was held in Kāśmīra about the beginning of the Christian era, Sanskrit has been chosen as the principal medium of Buddhistic communications and the Buddhistic books have generally been written in the Sanskrit language.

Thousands of Indian books written in the Sanskrit language have recently been recovered from or traced in Nepal, Tibet, China, Japan, etc. But very few Indian books written in the Pāli language have been obtained from those places. Are we then to suppose that with the rise of the Mahāyāna school about the 1st Century A.D., the use of the Pāli language in the sacred scriptures was altogether stopped in India? I daresay the answer is no, for, even in the 5th Century A.D., when the Mahāyāna school attained its highest development, India produced several eminent Pāli writers of whom Buddhaghoṣa[1] stands as the foremost. In the Ceylonese records[2] we find indications that even up to the year 1462 A.D. Ceylon used to derive some of its Pāli literature from India and Buddhist monks were in large numbers sent to Ceylon by the Southern Indian kings of the Choḷa and other dynasties. It is not within the scope of this paper to enumerate all the Pāli writers that flourished in India between the 1st Century A.D. and 15th Century A.D. In the present paper I shall give a brief account of only one of the many Pāli writers that adorned India during that long period. The name of this writer was Anuruddha Thera.

Anuruddha was the author of three works in the Pāli language, *viz.*, Abhidhammatthasaṁgaha, Paramatthavinicchaya and Nāma-rūpa-pariccheda. Besides, he was the author of a didactic Buddhistic poem in classical Sanskrit which is generally known under the name of Anuruddha-śataka.[3]

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[1] Vide Mahāvaṁsa, chapter XXXVII.

[2] Mahāvaṁsa, Rājāvali, Rājaratnākari, Saddharmālaṇkāra, commentary on the Visuddhimagga, etc.

[3] In the Saddhammasaṁgaha, chap. IX, verses 14, 15, London Pāli Text Society's edition (*Vide* J.P.T.S., 1890), two Pāli works of Anuruddha have

In the Saddhammasaṁgaha and Paramatthavinicchaya it is stated that Anuruddha was born in Kāñcipura on the Kāveri where he spent the early part of his life as a Buddhist priest. He gradually rose to the position of Saṅghanāyaka or High-priest. Subsequently he went to Tinnevelly and Tanjore and resided there for some time for the propagation of Buddhism. Afterwards he went over to Ceylon and was admitted into the priesthood of the Uttaramūla monastery. He is mentioned in the S'ataka as an *upasthavira*, but in the Saddhammasaṁgaha and other books he is described as a *thera*.

The Uttaramūla or Uttarola monastery[1] originated in Ceylon at the latter half of the 11th Century A.D. Anuruddha who belonged to that monastery[2] must therefore have lived after the 11th Century A.D.

In the Mahāvaṁsa[3] it is stated that Vijayabāhu I, who was King of Ceylon from 1065 A.D.—1120 A.D., sent messengers with gifts to the Rāmañña country unto his friend the King of

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been mentioned, *viz.*, Abhidhammatthasaṁgaha and Paramatthavinicchaya Thus we read there:—

अनुरुद्धेन थेरेन कञ्चिपुरवरे वरे ।
पकरणं कतं तेन परमत्थविनिच्छयम् ॥ १४ ॥
अनुरुद्धाभिधानेन थेरेन रचितम् इदम् ।
परमत्थप्पकासेतुम् अभिधम्मत्थसंगहं ॥ १५ ॥
(सद्धम्मसंगह, परिच्छेद ९) ।

Elsewhere we find the mention of two other works of Anuruddha, *viz.*, Nāmarūpaparicchcheda and S'ataka. The Abhidhammatthasaṁgaha has been published by the Pāli Text Society of London, and the S'ataka by the Buddhist Text Society of Calcutta.

[1] Mahāvaṁsa, chap. LVII, verse 20.

[2] ज्योत्स्ना हिमांशोरिव यन्मुखेन्दो-
र्निस्यन्दते सूक्तिरसौ सुधीरः ।
इदं व्यधत्तोत्तरमूलहार-
रत्नाङ्कुरोपस्थविरानुरुद्धः ॥ १०१ ॥ (अनुरुद्धशतक) ।

[3] Mahāvaṁsa, chap. LX, verse 5.

Anuruddha to bring from there some learned Buddhist monks and elders of the church. I have reasons to believe that the Rāmañña[1] country was identical with the kingdom of the Pallavas that lay in the Coromandel coast, and "the King of Anuruddha" was the Pallava King in whose territory Anuruddha was born and from whose territory learned monks including Anuruddha himself were taken over to Ceylon. Anuruddha must on this supposition have gone to Ceylon early in the 12th Century A.D. when Vijayabāhu I was King of the island.

Kāñcipura in which Anuruddha was born is identified with modern Conjeeveram, 43 miles south-west of Madras. It was the capital of the ancient kingdom of Drāviḍa and was the residence of the kings of the Pallava dynasty till that dynasty was overthrown by the Cholas at the close of the 11th Century A.D. Rājarājendra Kulottuṅga Chola I, who reigned from 1064—1113 A.D., is said to have completely crushed the power of the Pallava kings and to have destroyed the city of Kāñci. He, however, subsequently rebuilt and greatly improved that city but selected Tanjore as the permanent place of residence of the Chola kings. Anuruddha, we have seen, lived both in Kāñci and Tanjore

It may be noted here that the Pallava Kings who reigned in Kāñci were staunch Buddhists and belonged to the Sthavira school. It has already been stated that they were overthrown by the Cholas in the 11th Century A.D. From that time downwards they remained as vassals under the Chola kings. The last mention of the Pallavas as a dynasty occurs, as far as it is known at present, about the year 1223 A.D. In 1310 A.D. the Cholas being conquered by the Mahomedans Kāñci passed into the hands of the conquerors. Early in the 12th century A.D. Rāmānuja, the celebrated Vaiṣṇava preacher, flourished in Śrīperumātur, 18 miles east-north-east of Kāñcipura, and converted the kings of the Chalukya, Chola and other dynasties into his religion. The Buddhists were henceforth persecuted by the Vaiṣṇavas of the Rāmānuja school as well as by the Mahomedan conquerors. Still Buddhism lingered for some time in Kāñcipura or Conjeeveram and finally disappeared from it at the close of the 15th Century A.D. Anuruddha Thera, who flourished in Kāñcipura early in the 12th Century A.D., was by no means the last Buddhist Pāli scholar of that city.

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[1] In Burmese books we find, however, that Anaurata or Anuruddha was the 42nd (or 44th) King of Pagan and Rāmañña or Ramagnia is the country round Thaton. *Vide* Bigandet's Legend of Gaudama, Vol. II, pp. 145-146 (3rd edition). Rev. T. Foulkes observes :—" Sir Emerson Tennent guesses that this Kingdom of Aramana [Rāmañña] may be a part of the Indo-Chinese Peninsula probably between Arracan and Siam ; and Turnour had already, without giving any authority, fixed it in Arracan ; but the passages in the *Rājaratnākari*, the *Rājāvali* and the *Mahāvaṁsa*, in which it is mentioned, clearly locate it on the Coromandel coast ; and, as it is not Pāndya nor Chola, the only part of that coast which remains is that which lies between Chola and Kalinga, namely, the old dominions of the Pallavas." The *Indian Antiquary*, Vol. XVII (1888), page 126.

11. *The Colouring Principle of the flowers of Nyctanthes Arbor-tristis.*—*By* E. G. Hill, B.A.

The *Nyctanthes Arbor-tristis*, known in Urdu as "Harsinghar," is a large shrub of the order Oleaceæ. The flowers are sessile in bracteate fascicles, they are pedunculate and are arranged in short terminal trichotomous cymes; the corolla tube is orange, and the limb white. The flowers open at night and fall to the ground the following day. They are then collected for use in dyeing. The plant grows most abundantly in the sub-Himalayan districts.

For use in dyeing, the flowers are steeped or boiled in water and the solution strained off. It is a beautiful rich golden-yellow, and dyes cotton fabrics without a mordant. The effect is transitory, the colour fading slowly. When used with alum or lime-juice the colour is brighter and less transitory, but the chief use of the dye is in combination with turmeric and safflower. It is seldom used with indigo. It is sometimes employed for colouring fancy leather-work. With safflower, turmeric, red ochre, myrobalans and sulphate of iron it gives a fast maroon-brown, and with *Butea frondosa* and indigo and acidulated water, a fast grape green.

No reference has been found to this flower in the chemical literature at my disposal, but in 1902, A. P. Sirkar made in my laboratory, a preliminary investigation into the colouring principle, which he considered existed in the flowers as a glucoside. He was unable to obtain this in a pure state, owing to its sparing solubility in most solvents, but he suggested $C_{15}H_{21}O_6$ for the colouring matter, although on boiling this with dilute hydrochloric acid, he obtained a substance with a brighter colour and a higher percentage of carbon. He also considered that there were two methoxy groups present in the compound and at least one carbonyl group.

The most noticeable feature of the colouring matter was the high percentage of hydrogen which was invariably obtained on combustion.

The method of work was as follows:—

Aqueous extract.—The flowers were extracted in cold water and the extract carefully filtered. The infusion was light-yellow in dilute, and dark-brown in concentrated solutions. It had a great attraction for flies. The infusion gave an acid reaction with litmus, and a yellow precipitate with basic lead acetate which became yellow on addition of ammonia. With copper sulphate it gave a pale-yellow precipitate, which became green with ammonia. Stannous chloride gave a turbidity which disappeared on adding acetic acid. Ferric chloride gave a greenish-black colour which darkened on adding ammonia. Fehling's solution was reduced, as were also gold chloride and ammoniacal silver nitrate. It gave no reaction with gelatin. When a few drops of the infusion were carefully added to a few cubic centimetres of concentrated sulphuric acid, an intense blue colour was produced at the junction of the two liquids. This soon darkened and disappeared.

When the infusion was allowed to stand for a few days alone, a reddish-brown deposit settled. If a little hydrochloric acid was added to the infusion, a reddish flocculent precipitate settled after about twelve hours. A similar precipitate was obtained by heating the infusion with basic lead acetate, decomposing the washed yellow precipitate with sulphuretted hydrogen, and warming the yellow solution obtained on filtering. The amount obtained was always very small, but attempts to get more from the solution by heating on the water-bath with dilute hydrochloric acid resulted in the deposition of a black amorphous substance. When dried, it was very light and friable, and varied in colour from a very dark-brown to a jet black. On evaporating the solution after removal of this black substance, it was found to contain a sweet substance, which reduced Fehling's solution on boiling.

About two grains of the red colouring matter were collected, and washed with water. On boiling with alcohol a large quantity dissolved, and the residue appeared to consist of mineral matter. The alcoholic solution on evaporation gave a dark-red lustrous deposit. This was entirely soluble in alcohol. Thus obtained, the substance melted between 250° and 260°, dissolved in alcohol, ethyl acetate, and ether, but it could be made to crystallize from none of these. It also dissolved readily in alkalis and alkaline carbonates, and in a solution of borax. It was sparingly soluble in chloroform and carbon bisulphide, insoluble in benzene and cold water, very slightly soluble in hot water, and soluble in acetic acid.

Alcoholic extract.—Owing to the apparent high solubility of the colouring matter in alcohol, some of the flowers were extracted in a Soxhlet apparatus with alcohol (sp. gr. ·810) till they were colourless, and the hot alcohol was then allowed to cool. On cooling, bunches of needle-like crystals had settled all over the flask. These were pale-yellow, but after several recrystallizations became white. They had a sweet taste, reduced a solution of ammoniacal silver nitrate, but did not rotate polarized light.

Analysis gave :—

Carbon = 39·62
Hydrogen. = 7·96

$$\left.\begin{matrix}\text{Mannitol}\\ C_6H_{14}O_6\end{matrix}\right\}\text{ requires }\left\{\begin{matrix}C=39{\cdot}57\\ H=\ \ 7{\cdot}7\end{matrix}\right.$$

The crystals melted at 166° ;
Mannitol melts at 168°.

When the filtrate from the mannitol was slightly evaporated and cooled, no further precipitation occurred, but a small quantity of wax separated. The residue contained crude colouring matter with some resinous products. To obtain the colouring principle, the alcoholic solution was heated with dilute hydrochloric acid, when a bright scarlet product was obtained. This was filtered off and washed with alcohol.

The yield was very small, but thus prepared, the colouring principle was only very slightly soluble in all solvents. If dissolved in large excess of alcohol and allowed to evaporate the colouring principle deposited a microscopic powder which seemed to be crystalline when viewed under an oil immersion ($\frac{1}{12}$).

Preparation of the colouring principle.—Since the above method was obviously not adapted to the preparation on a large scale, the colouring matter obtained by hydrolysis of the aqueous extract was dissolved as far as possible in alcohol and the solution heated with hydrochloric acid, when, as a rule, the bright red colouring principle was deposited. It was only possible to work with small quantities at a time, and in some cases black tarry products resulted at once with no red deposit at all. Moreover in some cases it appeared that the hydrolysis of the aqueous solution resulted at once in precipitation of most of the colouring principle, in which case the precipitate from the acidified water solution would not dissolve to any extent in alcohol, and the colouring principle could not be extracted by this method. The extraction was thus attended with great difficulty, and it was found that the best method was to keep solutions dilute, not to add too much acid, and not to boil The flocculent precipitate from the aqueous extract was then moderately soluble in alcohol, and on warming the alcoholic solution with hydrochloric acid a red precipitate settled down which could be easily filtered off. This red precipitate was washed with alcohol and water, and the purified product collected.

For a long time this could not be obtained pure, but it was eventually found to crystallize from pyridine and toluene. In the former of these it was very soluble, in the latter moderately so.

The crystals were apparently of two kinds—one yellow and one red, but on gently warming the yellow crystals they became red.

The melting point of the crystals was 225°—230°. They were tested for methoxy groups by Ziesel's method; none were present.

Two combustions of an incompletely purified sample (it yielded a trace of ash on combustion) gave:—

$$\begin{matrix} C = 69{\cdot}10 \\ H = \ \ 7{\cdot}53 \end{matrix} \quad \text{and} \quad \begin{matrix} C = 68{\cdot}91 \\ H = \ \ 7{\cdot}34 \end{matrix}$$

$$x\ (C_4H_5O) \qquad \text{requires} \left\{ \begin{matrix} C = 69{\cdot}5 \\ H = \ \ 7{\cdot}2 \end{matrix} \right.$$

$$C_{19}H_{25}O_5 \qquad \text{,,} \quad \left\{ \begin{matrix} C = 68{\cdot}4 \\ H = \ \ 7{\cdot}5 \end{matrix} \right.$$

Several other combustions of other samples had been made in the course of the work. Results varied from 68·60 to 70·36 for carbon, and 7·34 to 8·3 for hydrogen. The author thus does not attach importance to the formulæ mentioned above. It is certain, however, that Sirkar's results are useless.

Properties of the colouring matter.—The red crystals were practically insoluble in water, *very* slightly soluble in ether, benzene, alcohol, ligroin, moderately soluble in toluene, and readily in pyridine. With strong sulphuric acid they gave an intense blue compound which rapidly became yellow through apparent absorption of atmospheric moisture.

The author hopes to complete the investigation on some future occasion.

12. *The Monasteries of Tibet.**—*By Rai* SARAT CHANDRA DAS *Bahadur*, C.I.E.

INTRODUCTION.

Tibet is the land of monasteries. Her history chiefly comprises records of the establishment of monasteries and temples and their endowments by the State, chiefs and nobles of the country, commencing from the middle of the 7th Century A.D., to the 18th Century.

There are eighteen different Buddhist sects, out of which four are widely distributed all over higher Asia including Tibet, Mongolia and Western China. Of these four sects three, *viz.*, Sakya, Dûk-pa and Ñing-ma have the red-cap, which they use during religious services only, to distinguish them from the remaining 15 sects. The fourth which is the reformed sect and therefore the purest of all, has become dominant since the middle of the 17th Century. Its monks use the yellow-cap. The Dalai Lama is the head of this Church.

In the official register at Lhasa, in 1882, the total number of monasteries belonging to the Yellow-cap Church was 1026 with 491,242 monks. Out of this number, 281 monasteries belonged to the provinces of Ū and Tsang which constitute Tibet proper, 150 to the provinces of Nyang, Lhobrag and Kong-po; 27 to Upper Kham; 154 to Lower Kham and 414 to Ulterior Tibet which is called *Poi-Chen* or greater Tibet. In this list village-monasteries and *Mani-lhakhang* (prayer-wheel temples) have not been entered.

The number of monasteries belonging to the three red-cap sects, is a little more than the total of the Yellow-cap Church institutions. This would bring the total of the monasteries of all the 18 sects to over 2,500 and that of the monks to about 760,000.

In Tibet every third boy in a family, as a rule, is sent to the monastery, in consequence of which the male population of the country may be roughly estimated at 2½ to 3 millions.

The Yellow-cap Church Lamas take the vow of celebacy, which circumstances precludes them from keeping female company. But many among them while residing abroad seldom conform themselves to monastic discipline.

The miserable pittance which the monks of even the State-supported monasteries get for their subsistence, hardly exceeds three *Tanka*, *i.e.*, 1½ Re. a month. Owing to this, about one-fifth of the monks in a monastery generally turn into traders. Many among them become mendicant priests and roam over the country in quest of the necessaries of life. These are called *Tāpā* or monastery-boys. The agricultural population often regard them with dread for their irregular habits of life and clamouring for alms.

There are few convents in Tibet and the number of nuns (*Tsûnmo*) in them is very small. While the largest monastery contains 10,000 monks, the largest convent can hardly count 100 nuns for its inmates. The nuns of Tibet have the reputation of being pure as only the most religiously disposed among the fair sex betake themselves to monastic life. The red-cap Lamas generally keep concubines called *Ani* who often dress as nuns.

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* Compiled from *Pagsam Jon zañ* and other Tibetan historical works.

Marriage being the exclusive privilege of the eldest brother in a landholder's family, the younger brothers seldom care to share the bed of the house-wife with him which the custom of the country allows. They generally keep concubines. It is true that there is marriage among the rich cultivators and herdsmen, but the majority of the common people make family in wedlock either singly or jointly. Thus, side by side with polyandry, concubinage has become a popular institution in Tibet. Out of 100, 99 people keep concubines. This explains the question as to what becomes of the majority of the female population who remain unmarried. The Tibetan male is generally less jealous than the Tibetan female which circumstance has given rise to the formation of that much despised relationship called *Nyamdo-pûn*, i.e., brotherhood in wedlock *versus* brotherhood in matrimony which is polyandry pure and simple.

RA-DENG.

ར་སྒྲེང་།

The monastery of Radeng was founded by Dom-ton-pa [1] in the year 1056 A.D. Many predictions were on record in some of the sacred books such as Mañjuçrī Mūla Tantra,[2] Phalpo-che, Do ñiñje Padma Karpo,[3] etc , as to the rise and progress of a great school and monastery in the centre of Tibet. Conformably to them, Dom-ton-pa founded Ra-deng in one of the finest spots of Ū,[4] rich in various kinds of alpine vegetation. The valley of Ra-deng is clad in thick forests of firs, cedars, cypresses, and junipers. It abounds in numerous brooks and fountains, which yield very good water. Nine mountains, the culminating cliffs of which have various slopes, form the back-ground of this famed old monastery. Many kinds of medicinal plants grow on these hills.

At this charming place which was possessed of many auspicious signs essential to the site of a sacred Buddhist institution, Dom-ton-pa built the monastery of Khyungo-chan, or "Eagle's head," in the vicinity of the hill of Senge-tag [5] (lion's rock). The valleys which open to the east and west of Ra-deng have spacious plateaus rich with verdure. On account of the tall and horn-like shape of the trees growing in this place, the monastery of

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[1] འབྲོམ་སྟོན་པ།

[2] འཇམ་དཔལ་རྩ་རྒྱུད།

[3] མདོ་སྙིང་རྗེ་དཀར་པོ།

[4] དབུས།

[5] སེང་གེ་བྲག།

Khyungo-chan[1] was called Ra-deng from (rwa, 'a horn,' and sgreng, 'standing erect.') The large silver tomb which contains Atiça's[2] remains is the most remarkable of all the sacred objects of Ra-deng. The central chapel of the monastery contains a complete set of the images of the *Tantrik* pantheon, in which Buddha is observing the triple vows, Maitreya watching the course of the world, and the four gods of medicine (Manlha)[3] looking to the four quarters as in life. Outside the cupola of the great *Chorten* was constructed the mansion of the chief *Tantrik* deity of *Guhya Samāja* (the mystic commune) with a number of mystical gods, all in relief. When the erection of the monastery with the images was completed, Dom-ton-pa is said to have propitiated the god of the *Tushita* heaven to enable him to have his monastery consecrated by his spiritual father. Accordingly, Atiça, who was then seated on the right of Maitreya, the coming Buddha, showered flowers toward Ra-deng from *Tushita*. Dom-ton-pa presided over the monastery for eight years.

At Ra-deng there is a golden image of Milaraṣ-pa, the famous Buddhist saint. It is said that the *Jungar* Mongolian Chief, who persecuted the Ñiñ-ma[4] Buddhists in 1716, on his way to Lhasa visited Ra-deng, and was much astonished when he was told that the hair on the head of the saints' image was not artificial. In the library of Ra-deng there were many rare ancient Sanskrit works kept sealed by the Government of Lhasa. Ra-deng was the chief seat of the first and the earliest Buddhist hierarchy of Tibet and belonged to the Kahdam-pa School.

The Monastery of GAH-DAN.

དགའ་ལྡན་རྣམ་པར་རྒྱལ་བའི་གླིང་།

Tsong-khapa the great Buddhist reformer of Tibet, in fulfilment of a certain prophecy of Buddha, in the year 1408 A.D., established the grand annual prayer congregation of Lhasa, called the Mon-lam[5] chen-po. After making offerings to the gods he prayed for the welfare of all living beings. In the autumn of the same year he examined the auspicious signs regarding the suitability of a plot of land situated on the hill of Dok-poiri[1] with a view to erect on it a great monastery. In the rocks of that hill he observed many religious symbols such as the sacred mystic syllables "Om maṇi-padme hûm, om vajra pāni hûm," etc., and seeing that there was some scarcity of water, he touched with his hand the water of a little fountain that trickled down. On further examination the fountain proved to be the source of a streamlet. In the midst of the rocks of Dok-poiri he found several fossil conch-shells one of which having its whorls from right[2] to left was believed to have been used by the Buddha himself. From a rock-cavern in the neighbourhood he unearthed a mask believed to have been used by the Lamas during King Thisrong-deu tsan's[3] time. It had the miraculous power of dispelling all the evil spirits of the place. On this auspicious place Tsong-khapa laid the foundation of the world-renowned monastery of Gahdan. Within the remaining months of the year the Dukhang-Uma[4] (central congregational hall), seven cells for the residence of monks, and a building for the high-priest's residence, were finished. As soon as the monastery approached completion, presents of gold, silver, precious stones, and other articles from the pious flowed to it from different quarters. The number of monks increased every year. Tsong-khapa furnished the monastery with numerous religious books, objects and symbols. In the 64th year of his age he erected the *Tsang-khang*[5] the principal chapel in the monastery. This was followed by the *Gon-khang*,[6] the chapel of the hideous looking gods of mysticism. Then were constructed the *Khyamra* or courtyard, and overhanging it all round, porticos resting on 70 pillars. The *Tsang-khang* or chapel of worship was provided with a large image of the Buddha, three superb mansions of the gods of the *Tushita* heaven made of precious stones, with Bhairava, Mañju Çri, the deities presiding over the destinies of all living beings of the world and with the huge images of the four Lokapāla. He also enriched the library with many rare books of Buddhism. At Gahdan there are now only two colleges for religious instruction to 3,300 monks, *viz*:—

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[1] ཁྱུང་མགོ་ཅན།

[2] ཨ་ཏི་ཤ། The name by which Dīpaṃkara Çrijñāna the high-priest of Vikrama Çila *Vihāra* of Magadha is known all over Tibet. He was Dom-ton-pa's spiritual teacher and died at Ñe-thang near Lhasa only three years before the foundation of the monastery.

[3] སྨན་ལྷ། [4] རྙིང་མ། [5] སྨོན་ལམ་ཆེན་པོ།

(1) Çar-tse Tva-tshang,[7] where metaphysics are taught.
(2) Chyang-tse,[8] where esoteric Buddhism and mysticism are taught.

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[1] འབྲོག་པོ་ཨི་རི།

[2] དུང་དཀར་གཡས་འཁོར།

[3] ཁྲི་སྲོང་ལྡེའུ་བཙན།

[4] འདུ་ཁང་དབུས་མ།

[5] གཙང་ཁང་།

[6] མགོན་ཁང་།

[7] ཤར་རྩེ་གྲྭ་ཚང་།

[8] བྱང་རྩེ།

Later on, during the ministry of Tsong-khapa's illustrious successors, the monastery became converted into a grand university both for secular and religious education.

In the temples erected by *Gyal-tshab*[1] Darma Rinchen and Dul-dsin the most remarkable object is the Nam-gyal[2] *Chorten*,[3] which contains the remains and personal properties of the great reformer. A satin tent hangs over the altar containing the urn. During the ministry of Gedun Phun-tshog Lozang Tauzing,[4] Tashi Badur the great Khan of Kokonar covered the silver tomb of Tsong-khapa with thin plates of gold. (The gold used there is said to have been one year's revenue derived from Kham). On the right and left of this central tomb-*chorten* there are the tombs of the disciples and the illustrious successors of the founder. In some of them are placed their respective statues.

In the chapel, called Serdan-Tsangkhang[5] (golden pure hall) at the centre of the great temple called Yang-pachan, there are the images of Buddha, Maitreya, and Amitābha. In the *Gonkhang* the life size statues of Kushi Khan[6] and his generals are placed in martial attitude. Besides these, stand several mythological warriors all in divers frightful attitudes. In the chapel called Dubchoi[7] Tsang-khang the remarkable thing is the image of Çamvara the chief of the *Tantrik* deities, with the *Sakti* (female energy) in his clasp.

In the Lama-khang a statue of Tsong-khapa, his works in original, painted tapestries, a set of Kahgyur scriptures written in gold, etc., are among the remarkable articles. This was Tsongkhapa's study in his old age. There are also several *Chortens* and an image of Vajrā Bhairava, the fearful defender of Buddhism. In the Sarma-khang, erected by Lodoi Choikyong,[8] there are the images of the Buddhas and Bodhisattvas made of gold, sandal-wood, medicinal minerals besides numerous *chortens*, tapestries, pictures, etc. In the De Çeg[9] Lhakhang, *i.e.*, the temple of the Tathāgata there are eight silver *chortens* consecrated to the eight Buddhas. The most prominent of the images of the temple called Chyamkhang is that of Maitreya, the future Buddha, which is said to have come flying from Magadha. Beside it, stand in row the images of several Bodhisattvas. In the Zim-khang[10] the private residence of Tsong-khapa, which contains the chair of the great reformer, is to be seen the curious image of the hero Khanda Kapāla with a halo of variegated colours round his head. In the ascetical cell called *H*od*salphug[1] (the cavern of light) where Tsong-khapa used to perform ascetical meditation the images of the terrific Vajrapāṇi and his retinue attract the attention of the pilgrims. In the interior of the hall of priestly assembly called Dukhang-Karpo,[2] the Serthi[3] (the golden chair, *i.e.*, the hierarchical throne) and the statue of Tsong-khapa impress the faithful pilgrim with awe and reverence. Phola Jûng Wang provided this temple with a gilt dome built after the Chinese style and deposited in it a set of 108 volumes of the *Kahgyur* scriptures written in gold. In the Nai-choikhang[4] a tooth of the saintly reformer, called Tsem-Hodzer-ma[5] (the lustrous tooth) and the image of the thousand armed Avalokiteçvara whose eleven heads look with eyes of mercy on all living beings of the world, are remarkable.

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[1] རྒྱལ་བའི་ཚབ། [2] འདུལ་འཛིན།

[3] རྣམ་རྒྱལ། [4] དགེ་འདུན་ཕུནཚོགས་བློ་བཟང་བསྟན་འཛིན།

[5] གསེར་ལྡན་གཙང་ཁང་། [6] ཀོ་ཤྲི་བསྟན་འཛིན་ཆོས་རྒྱལ།

[7] གྲུབ་ཆོས། [8] བློ་གྲོས་ཆོས་སྐྱོངས།

[9] བདེ་གཤེགས། [10] གཟིམས་ཁང་།

In the college of Chyang-tse, there is an elephant illustrative of one of Buddha's former births with a number of devout followers, all made of horn. There are also some representations of sainted fairies called Khandoma,[6] and a set of *Tantrik* bone ornaments including strings of beads, earrings, chains, amulets, etc., all made of human bones. All these are said to have once been used by the Indian saint Naropa. Naropa's mitre-shaped crown and his Tshebûm (pot of longevity) containing consecrated water which never dries, are looked upon by devout pilgrims as wonderful objects of veneration. In the Gonkhang of this college there are terrific representations of the Lord of Death and his frightful companions, messengers, and guards. In the *Parkhang* (printing house) are to be seen Tsong-khapa's voluminous works—all engraved on wooden blocks which are piled up in different rooms from which impressions can be had on *daphne* paper, at any time, at a small cost. In the temple of Yangpa-chan[7] there are the scenes of Buddha's triumph over Māra (the evil one) and his legions. In the outer passage of circumambulation called *Chyi-kor*[8] pilgrims are shewn many self-existent (*Rang-Jûng*)[9] sacred letters, figures, and fountain heads, finger-marks and footprints on rocks, and outside of this passage there is a lofty seat consecrated to the mountain god of Ma-chen Pomra, who is said to have patronised Tsong-khapa in his arduous works. The successors of Tsong-khapa, who are appointed by election from among the most learned and pious Lamas of ordinary birth, occupy the hierarchical throne called *Serthi.* They are, therefore, called Gahdan *Thi-pa,*[1] *i.e.,* President or Chairman of Gahdan. Men of learning generally resort to Gahdan. Its monks, for the excellent education they get in the university, always rise to distinction in the public service both secular and religious. All sections and classes of men are represented at Gahdan.

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[1] འོད་གསལ་ཕུག།

[2] འདུ་ཁང་དཀར་པོ།

[3] གསེར་ཁྲི།

[4] གནས་ཆོས་སྐྱོངས།

[5] ཚེམས་འོད་ཟེར་མ།

[6] མཁའ་འགྲོ་མ།

[7] དབྱངས་པ་ཅན།

[8] ཕྱི་སྐོར།

[9] རང་བྱུང་།

The monastery of Sangkhar which contains 200 monks at Dachan,[2] north of Lhasa, was founded by Tsong-khapa under the auspices of a rich noble named Rinchen Shun-pa of Tag-kar. It is under the supervision of the Gahdan *Thi-pa.*

The Monastery of SERA.

སེ་ར་ཐེག་ཆེན་གླིང་།

The monastery of Sera (literally, wild rose) was founded by *Cham-chen-choije* Çākya Yeçeṣ[3] in 1418, the year of Tsong-khapa's death.

The Governor Neḥu-pa who patronised Tsong-khapa and his disciples, frequently used to invite them to Sera-tse,[4] a retired hermitage on the top of the hill overhanging Sera. On these occasions *Choije* devotedly served the reformer, in consequence of which Tsong-khapa predicted a great future for a monastery which *Choije* would found in that neighbourhood. A saintly Lama while sitting in meditation, cast his eyes on a spot lower down the hermitage which was filled with wild rose plants in blossom. He predicted that some day there would be a monastery there. Emperor Yûnglo of the Tāming dynasty, had sent an invitation to Tsong-khapa to visit Peking; but the great reformer, finding *Choije's* time fully occupied with the more important work of religious reformation, sent Çākya Yeçe*s* as his representative. Yûnglo did honour to the Yellow-cap Church by showing every consideration to this disciple of the reformer on his arrival at Peking where *Choije's* first act was to bring about the recovery of the Emperor from a serious illness by the efficacy of his religious services. The temple of Maitreya, then recently built by the Emperor, was placed in his charge and he was given the name of Chyam-chen *Choije.* Under the Imperial auspices *Choije* founded the monastery of Hwang-sze (Yellow-temple) in one of the imperial gardens of Peking situated a few miles to its north. For diffusing the reformed creed of Tsong-khapa in China he had taken with him several of Tsong-khapa's works and a set of block-print Kahgyur scriptures. After converting the Lamas of Peking to the reformed Yellow-cap Church he returned to Tibet. On the way he paid his reverence to Tsong-khapa making rich presents to him. Subsequently, he founded the monastery of Sera *Theg-chen-ling*, which now contains 5,500 monks and exercises much influence in the secular and religious administration of the country.

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[1] ཁྲི་པ།

[2] བདེ་ཅན།

[3] བྱམས་ཆེན་ཆོས་རྗེ་ཤཱཀྱ་ཡེ་ཤེས།

[4] སེ་ར་རྩེ།

He established a university in it with four *Tva-tshang* or colleges. Of these Gya-*Tva-tshang* belonged to the upper division of Sera and the remaining three, *i.e.*, Thoisam, Norpuiling, Chyipa Khamang *Tva-tshang*, and Ñag-pa *Tva-tshang* belonged to Sera Mēh, (*smad*) *i.e.*, lower division of Sera. In the middle of the eighteenth Century two of the colleges were established. It still continues to be a favourite resort of learned men of Tibet and Mongolia. The monks of Sera belong to respectable families of Tibet proper, Amdo, Kham, Ñyagrong, Mongolia and Western China.

There are in the Dukhang (grand hall of congregation) the images of—

1. Buddha vanquishing Māra the evil one and a host of demons.
2. The sixteen Sthavira (Neh-tan Chu-rûg[1]) brought from China.
3. Several life-like images constructed by the famous artist Neẖu Chang-wa.

In the Gonkhang (the temple assigned to the *Tantrik* deities there are—

1. The image of the six-armed Bhairava, constructed by Leggyan of Shwau.
2. Gon-po Choigyal with four arms.
3. The goddess Paldam Lhama (Kāli) on horseback, her legs being tied by a chain, probably as a punishment for her wicked conduct.

In the front wall there are painted representations of the invasion of Û by the Tsang army and their defeat by the Tartars in 1643, the scenes of war, and the images of fearful spirits, such as Gon-po De-mar, the genius (Chyarog-dong-chan, he with a raven's head), etc. On the western wall are painted the likenesses of the successive high priests of Sera, etc.

In the western corner of the upper congregation hall (Dukhang Gong-ma), are the images of Amitābha Buddha, the eleven-headed Avalokiteçvara and the four-armed Gon-po, Maitreya made of silver, the Bodhisattva (Çākya) as a citizen, and the eight spiritual sons of Buddha and also the Kah-gyur and Tangyur collections, all written in gold and silver.

In the temple of Chyam-chen Shal-reh Lhakhang, the image of Atiça with a *Chintamani* wishing-gem in his hand is conspicuous.

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[1] གནས་བརྟན་བཅུ་དྲུག །

In the Go-chye-khang there are the images of Buddha and a silver *Chorten*. In the further niché of the Dukhang there is a golden image of the coming Buddha. In the front hall of the Dukhang there are the Dharma Pāla. The most remarkable object in the passage of circumambulation round the monastery is a small *Chaitya* (said to be one of the 84,000 *chaitya* constructed by Emperor Açoka) which was brought from Magadha. There is also a *Tantrik image* of Hayagriba with the goddess Vajra Varāhi in his clasp.

The Monastery of DAPÛNG.

དཔལ་ལྡན་འབྲས་སྤུངས་ཕྱོགས་ཐམས་ཅད་ལས་རྣམ་པར་རྒྱལ་བ།

Dapûng the great monastery of lower Û, now the premier monastery of Tibet, was founded by Jam-yang Choije[1] in the year *Fire-monkey*, i.e. 1415 A.D. with 5,000 monks. His father Gah-wa Nor-shon, on account of his wealth, was believed to have been an incarnation of Vaiçravaṇa the god of riches. Jam-yang was born at Sam-yé, and admitted into the sacred order at Tse-thang (Chethang). He received his first lessons in sacred literature from the abbots of Sangphu. At Gahdan, Tsongkhapa and his principal disciples ordained him with the final vows of the order of *Bhikṣu*. At Tashi Dokha, Tsong-khapa advised Jam-yang and his friend Namkha Zangpo, the Governor of Neḥu-Dsong, to found a monastery after the model of the ancient monastery of Çrī-dhānya Kataka of Southern India. One night, while Jam-yang was asleep in the fort of Neẖu-Dsong he saw in a dream the god Nam-ña Karpo telling him that if he founded a monastery at Dar-bag thang, situated in front of the hill called Gephel Rivo-che, he could get 5,000 monks to reside and study in it. Accordingly, he visited Dar-bag and Rivo-che. There he saw several fountains and small lakes called "the lakes of fortune." On another occasion, while seated on the margin of a lake situated on the top of Lang-chen ri, Tsong-khapa mentioned to him that that was "the lake of learning." Another night he dreamt that several men were assembled on a river's edge in order to cross it. Jam-yang at once swam to the opposite bank and threw a bridge across to enable others to follow him. After several such curious dreams he determined to found the monastery of Dapûng. Tsong-khapa supplied him with the necessary plan after the model of Çrī-dhānya Kataka, and his friend the Governor of Ne*h*u Dsong, furnished him with funds; and through the joint exertions of Jam-yang and his patron, Dapûng was founded. On account of the Governor's help the rich nobles of Tibet gave endowments of lands to it and sent their boys for religious education there.

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[1] འཇམ་དབྱངས་ཆོས་རྗེ།

Their example was followed by the merchants and other landholders, in consequence of which it soon became a favourite institution of the aristocracy of Tibet. Jam-yang established eight colleges for teaching the different branches of sacred and secular learning. In course of time the monastery became the principal seat of learning, and learned and wise men flocked to it from the different parts of the country. In discipline, moral culture and purity of life, the monks of Dapûng excelled the monks of all other similar institutions in Tibet. It soon claimed a university with seven colleges for the study of the different branches of sacred literature including metaphysics, logic, medicine, and one for that of profane literature for the benefit of the lay people. After Tsong-khapa's death, Jam-yang presided over the Monlam-chenpo of Lhasa and raised it to prominence. From this circumstance the power of Dapûng over the Monlam-chenpo became paramount and continues so to this day. The president of the Monlam-chenpo called the Dapûng Shal-ngo, exercises supreme authority in the spiritual affairs of the country during the months of January and February, when the Talai Lama himself submits to the resolutions passed by the congregated clergy on the occasion. The chair of Dapûng was filled by many able and distinguished sages, among whom Paḷdan-senge, one of the disciples of Tsong-khapa, Jam-yang Gahlo, and Yontan Gyatsho of Tsang-thon, were the most learned. On the rise of Dapûng with its great university the glory of Gahdan was overshadowed. The fame of the Gahdan *Thipa* as the profoundest scholar of the Yellow-cap Church was surpassed by that of the high priest of Dapûng. Under the presidency of Gedun-Gyatsho who was called Dapûng Tûlpaiku (incarnate Lama of Dapûng), the monastery with its university claimed precedence even over Gahdan. Gedun-Gyatsho in whom the spirit of Gedûn-dûb had appeared was called Gyal-wa ñi-pa (2nd Gyalwa). He was, therefore, the first incarnate hierarch of the Yellowcap Church, from whose time the monastery enjoyed the proud name of Chyog nampar Gyal-wa—victorious in all the quarters, which expression is preserved to this day in the silver currency of Tibet.

Dapûng contained the following *Tva-tshang* or colleges :—

1. Tashi-gomang.
2. Lozang-ling.
3. Thoisam-ling.
4. Ñag-pa Namgyal-ling.
5. Ku chyog-ling.
6. Choikhor-ling.
7. De-yan.

Of these only four are now in existence. Thoisam-ling, Kuchyog-ling and Choikhor-ling were abolished during the presidencies of Sonam Gya-tsho and Lozang Gyatsho. There are at present 7,700 monks in the monastery, most of whom are recruited from noble families in Kham, Mongolia, Gyarong, Ñag-rong, Amdo, Û and Tsang. In the Zimkhang, Jam-yang *Choije's* residence, situated behind the grand cloister, is the image of Jam-yang Sûng-chon (speaking Muñju Çrí). In the central *Tsang-khang* (chapel) are the golden images of the Buddhas of the past, present and future in sitting posture and surrounded by their respective eight disciples. In the temple of Na-chu-tug Lhakhang there are the sixteen *sthavira* (sages) brought from China by the illustrious Phag-pa during the reign of the Emperor Khublai Khan. In the new chapel consecrated to Champa there are—the huge image of the coming Buddha, representing him as a youth of twelve, and a silver trident used by Jam-yang himself. In the Kalzang Lhakhang there are one thousand Buddhas, all made of copper gilt with gold. In the Kahgyur Lhakhang, *i.e.*, the library of sacred books, there are Kahgyur collections all written in gold. In the cloister of the Ñag-pa *Tva-tshang* (*Tantrik* College), there are many articles very sacred to the Buddhists. On the right of the image of Vajra Bhairava is the statue of Tsong-khapa and on its left is the image of the Lord of Death with his horrid train. The principal temple is three-storeyed. The principal hall of congregation called the Dukhang Chenpo on the ground floor contains 240 wooden pillars, distributed over an area of 34,560 sq. ft. to accommodate 7,700 monks when they assemble to perform religious service.

The third hierarch was Paṇ-chen Sonam Tag-pa; the 4th, Sonam Gyatsho, the Dalai Lama; 5th, Yontan Gyatsho, Dalai Lama; 6th, Paṇchen Lozang Choigyan of Tashilhunpo; 7th, Ñag-wang Lozang Gyatsho, the 5th Dalai Lama; 8th, Ñag-wang Yeçe Gyatsho (Pakardsin-pa); 9th, Kalyang Gyatsho (7th Dalai Lama) in the year 1726.

The Monastery of MERU was one of the four sanctuaries founded at the four cardinal points of Lhasa by King Ralpachan in the 9th Century A.D. It was abolished by King Langdarma, but was afterwards restored to its former condition and formed the metropolitan monastery.

CHAGPOIRI is a monastic institution with classes for the study of medicine. It is called the Man-pa *Tva-tshang* or the Medical College. It does not contain more than one hundred pupils.

Phabong-kha was anciently King Srong-tsan Gampo's favourite resort, where he used to propitiate his tutelary deities. The seven early monk-scholars called Sedmi-midûn also had their residence there. During the persecution of Buddhism by King Langdarma there existed no monastic establishment at Phabongkha. Geçes Tag-kar-pa revived the institution. During the hierarchy of Sakya, Dogon Phagpa repaired the monastery and gave rich endowments for its maintenance, but during the dispute between Sakya and Phagmodû it again dwindled into insignificance till it was repaired by Thegchan Choigyal and revived by Je-Deleg-Ñima. But again, when internal discords convulsed Tibet, it declined and remained in a neglected condition till the year *Earth-sheep* of the tenth cycle when Minister Paljor Lhûndub of the family of Khon rescued it from ruin. Since then it has been flourishing.

Sangphu Neḫu thang, situated on a hill beyond Ñethang, was founded by Dôg Leg-çe in the same year when Sakya was established.

13. *Notes on an Indian Worm of the Genus* Chætogaster—*By* NELSON ANNANDALE, B.A., D.Sc., *Deputy Superintendent of the Indian Museum.* (With one plate.)

The fresh-water worms of the genus *Chætogaster* are held by some authorities to constitute a separate family; but Beddard,[1] whom I have followed in drawing up my account of *Ch. bengalensis*, regards them as belonging to the Naidomorpha, a rather obscure group of Oligochætes which appears to be well represented in the Calcutta tanks. Hitherto the genus, well known in Europe and recorded from America, does not appear to have been reported from within the limits of Asia. The Calcutta species is not uncommon and I have taken specimens of what may be a second in the Botanical Gardens at Sibpur. This merely proves, as I have already pointed out to the Society, that a vast field lies open to any naturalist who would devote himself to the study of Indian pond life. I am much indebted to my friends Mr. F. F. Laidlaw, of Owen's College, Manchester, and Dr. J. H. Ashworth, of the University of Edinburgh, both for the generic identification of the worm in the first instance and for references to literature later. My thanks are also due to Major A. Alcock for his unfailing sympathy and assistance in the work undertaken.

DESCRIPTION of *Chætogaster bengalensis*, sp. nov.

Prostomium forming a large, sub-circular sucker: another smaller sucker at the posterior extremity of the body. Œsophagus longer than pharynx, with two well-marked dilatations, the posterior of which shows indications of a second constriction in its posterior third when empty. The anterior dilatation is covered with large, flat, polygonal cells of a faint yellowish colour. There is a sense-organ (otocyst?) in the brain: the remainder of the nervous system normal for the genus, the somewhat discrete nature of the ventral ganglia, their number in the first few segments and the separation of the two ventral nerve chords in the same region being characteristic. The first pair of nephridia is larger than the others posterior to it. Setæ arranged on each side of the ventral surface in bundles of from 15 to 17. Body colourless and almost transparent. Length varying greatly with state of contraction, at least 10 mm. when the body is fully expanded. There is a very distinct flattened area on the ventral surface between the two bundles of setæ. Outward appearance somewhat resembling that of an *Æolosoma*.

Possibly this worm should be regarded as the type of a new genus; but it seems more convenient to regard it for the present as a *Chætogaster*.

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[1] *A Monograph of the Order Oligochæta*, p. 304. Oxford, 1895.

BIONOMICS OF *Chætogaster bengalensis*.

The *Chætogaster* of the Calcutta tanks is usually found clinging by means of a posterior sucker to the external surface of the body or the edge of the shell of a water-snail. When disturbed it withdraws itself entirely within the latter. It does not confine itself to any one species of snail, but generally chooses a *Limnæus*, *Limnophysa* or some similar species, apparently because these genera are common in its habitat, do not possess an operculum and have a wide aperture to their shells. In one instance I saw, in an aquarium in which snails were somewhat scanty, a solitary worm attempting to establish itself on a *Planorbis;* but the connection was only temporary, not lasting for more than a few minutes. The mouth of the shell in this genus, though there is no operculum, is evidently too constricted to be suitable for the worm, which is generally gregarious. As shown by the figure (plate III, fig. 1), a considerable number of individuals may establish themselves on a single snail. Occasionally *Ch. bengalensis* quits its host altogether and either wanders away in search of another or drops to the bottom. This happens whenever the water becomes foul or reaches too high a temperature (in an aquarium when the sun, falling directly on the surface, heats the water), or when too many individuals are settled on a single host after rapid asexual multiplication. Before fixing themselves on a fresh snail they frequently crawl over the external surface of the shell.

Progression is mainly effected by a series of contractions and elongations of the body, aided by the two suckers. The posterior of these having been fixed to any surface, the body is stretched forward to its greatest extent. The anterior sucker is then applied, the posterior one set free, and the body contracted. As a rule, the ventral surface is not lifted, but something analogous to the "looping" of a leech or a Geometrid caterpillar, but not so marked, takes place very occasionally. When sinking through the water, as it does when its hold is released, the worm can change its direction slightly by moving the posterior part of the body from side to side; it cannot swim or raise itself upwards without support. The setæ appear to play a very small part in ordinary progression, except as aids in adhesion. Each bundle is capable of an independent rotatory motion somewhat resembling a rapid turn of the wrist. This movement is very useful when the worm is insinuating itself into a crevice, as it thrusts the body forward rapidly. All the setæ are frequently moved at once, although each bundle can be turned separately. The anterior bundles have a different function, as we shall see.

Although this species[1] lives in close connection with water-snails, it is not, strictly speaking, parasitic upon them; for it captures living prey and only uses its host, so to speak, as a beast of burden and a stalking horse. Carried along clinging to it by the posterior sucker, the body is extended outwards as far as possible and waived rapidly in all directions, the "head" being invariably free of the snail's shell. As soon as it comes in contact with the body of a small crustacean, the anterior sucker takes a firm hold. Its ventral surface is covered with small prominences, which are not grandular but mere projections of the epidermis. These probably give an additional grip, the limbs of the struggling prey becoming entangled amongst them. The anterior setæ do not project free from the ventral surface as in the posterior bundles, but are contained in a pocket or introvert in such a way that they lie below the mouth inside a lower lip or lobe which forms the wall of the posterior part of the prostomial sucker. As long as the body is elongated they are placed almost parallel to one another in a vertical line, leaving the aperture free; but as soon as the body is contracted, a rapid twist of their bases takes place and they spread out in a fan-like formation, so that the tips of the inner setæ of each bundle are practically in contact with those of the other side. (There is no difference in structure or arrangement between these setæ and those posterior to them, but the latter are considerably shorter). By the movement described the prey is seized by the setæ and conveyed into the mouth, which opens directly into a large pharynx with greatly thickened walls, a small lumen, and numerous muscle-bands radiating from it to the body-wall. A function of this organ seems to be to crush the prey to death; but a similar pharynx is found in species in which the food probably does not need crushing. A narrow slightly coiled passage leads into the first dilatation of the œsophagus. The cells on the surface of the latter probably have some digestive function ("liver cells") and the interior of the crustacea swallowed become disintegrated very largely in this chamber. Even at the moment of the passage of food into the second dilatation, the constriction between the two remains distinct. The feeble constriction in the posterior dilatation is a mere fold of the walls of the structure, allowing a certain enlargement to take place. The intestine which leads from the œsophagus to the anus is rather broad: this is rendered necessary by the bulky nature of the indigestible parts of the food, for the shells of small Copepods and Ostracods pass through the body of the worm practically unaltered, even the appendages remaining attached to the trunk in many cases.

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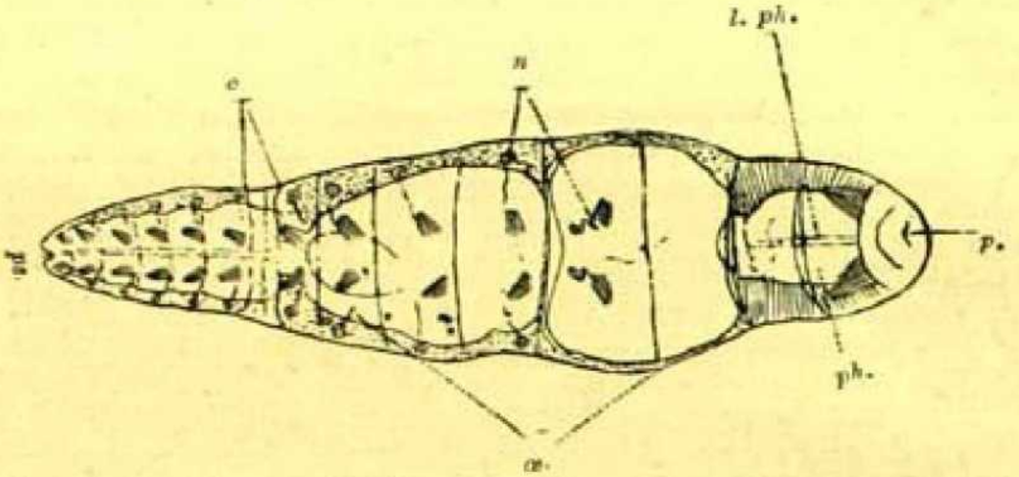
[1] The European species also live on water-snails, but some of them at any rate are said to be internal parasites. Dr. J. H. Ashworth has sent me a specimen of an English species in which the food probably consists of diatoms and the like.

Regarding sexual reproduction I have practically no information. During the period between December and April, throughout which I have had living specimens under observation, it does not take place and the sexual organs are imperfectly developed. Reproduction by fission is, however, active at this season. I find it a little difficult to say what is the normal number of segments present in the species, but it appears to be twenty or twenty-one. More than this number are, however, produced by budding from the penultimate segment, and at first it is impossible to distinguish between them and the original ones. When several have been produced, the most anterior can be distinguished from the others by a dilatation of the alimentary canal which ultimately becomes the pharynx of a new individual. The prostomium never takes its place as a regular segment in the series, but grows out as a lobe on the dorsal surface. The mouth of the young worm is in continuity with what will be the new anus of the parent and the shells of the food pass to the exterior of the old anus, at the extremity of the young individual, until the separation has been completely affected. This does not occur until at least 16 new segments (in addition to the old extremity) have been formed. The clitellum (10th and 11th segments) is already conspicuous, being devoid of setæ. In adult individuals, however, the glandular structure of its integument extends partially over another segment on either side.



—o—

EXPLANATION OF PLATE III.

Fig. 1. *Chætogaster bengalensis* on a Water-Snail, X 2.

„ 2. Anterior extremity of an adult individual from below, showing nerve cords, etc. (*Much enlarged*).
p.—prostomium, *l.*—lower lip, *s.*—anterior setæ, *n.*—nerve chords, *g.*—ganglia.

„ 3. Diagram showing arrangement of the setæ in a similar bundle from the right side. Each dot represents a seta in cross-section.

„ 4. A bundle of setæ from the left side of one of the posterior segments, seen from behind. (*Much enlarged*).

(*Text figure.*)

Fig. 1. Young *Chætogaster bengalensis* just separated by fission from its parent. (*Somewhat diagrammatic as regards the nephridia*).
p.—prostomium, *ph.*—pharynx, *l.ph.*—lumen of pharynx, *œ.*—œsophagus, *c.*—clitellum, *n.*—nephridia, *p.s.*—posterior sucker.

14. NUMISMATIC SUPPLEMENT V.

(With Plates IV & V.)

NOTE.—*The numeration of these articles is continued from p.* **116** *of the Journal for* **1904.** (*Extra number.*)

III.

SULTANS OF DEHLI.

31. *Muḥammad bin Tughlaq*, Pl. IV. 1.

A new variety of Muḥammad bin Tughlaq's lighter gold coins has recently been obtained at Agra by Mr. G. Bleazby who has sent it to me for publication. An almost similar coin of the same mint was described by me in the Journal of the Royal Asiatic Society 1900, p. 775. The date of the present coin, however, is different, and Daulatābād is given the title of حضرة instead of دارالملك. The coin is in very fine condition. In my paper above mentioned I suggested that the words in front of the mint name were قبه بن اسلام and not قبة دين اسلام as read by Mr. Thomas or قبة الا سلام as preferred by Mr. Gibbs. I have, however, since had reason to modify this opinion, as I find that on the gold coins of Firoz Shāh Ẓafar and Fateḥ Khān the form of the two first letters of the words الامام is identical with that of the same letters in الا سلام on the margin of this coin. I have therefore adopted Mr. Gibb's reading.

AV
Weight, 143 grains.
Size, ·7.
Mint, Ḥazrat Daulatābād.
Date, 730 A.H.

Obverse.	*Reverse.*
Kalima in circle.	ضرب في زمن
Margin.	العبد الراجي رحمة
هذا السكه في قبه الا سلام اعني حضرة دولت اباد ٧٣٠	الله محمد بن تغلق

H. N. WRIGHT.

IV.

MUGHAL EMPERORS.

32. *Jalāl-ud-dīn Akbar.*

(i) *Metal*, Gold. Pl. IV. 2.
Weight, 168 grains.
Mint, Hājīpūr.
Date, 983 A.H.

This unique mohur was acquired from a Hindu priest shortly after the last Magh Mela at Allahābād, to which it is said to have been brought by a pilgrim from Bengal. No coins from the Hājīpūr Mint were previously known. The place is situated in the Muzaffarpūr District, Bengal, and lies on the east bank of the Little Gundak, a short distance above its confluence with the Ganges opposite Patna. Hājīpūr figures conspicuously in the history of the struggles between Akbar and his rebellious Afg͟hān governors of Bengal, having been twice besieged and captured by the Imperial troops in 1572 and again in 1574 A. D. This mohur was struck in 1575, when apparently order was again restored. It is in fine condition and of the type of the mohur illustrated as Figure 65, Plate III. of the British Museum catalogue of Coins of the Mughal Emperors.

(ii) *Metal*, Gold. Pl. IV. 3.
Weight, 167 grains.
Mint, Jaunpūr.
Date, 988 A.H.

This is, I believe, the only *square* mohur of Akbar known from the Jaunpūr Mint. His square rupees from the same mint are extremely rare. The date on this mohur appears in the right-hand lower corner of the obverse—a comparatively rare occurrence.

(iii) *Metal*, Silver. Pl. IV. 4.
Weight, (looped.)
Mint, Jaunpūr-Chaitaur.
Date, 976 A.H.

This strange combination of names has long been a puzzle to me, which I have not yet succeeded in solving. There seems no doubt about the reading, and the coin is certainly genuine. It is of the usual type of Akbar's broad rupees from the Jaunpūr Mint (No. 96, Plate IV of the B.M. Catalogue), but with this difference that, while the name Jaunpūr appears in the usual place in the lower margin of the reverse, the word Chaitaur occurs in the upper margin on the same side of the coin. Hitherto only copper coins of Akbar were known from the Chaitaur Mint and none with two mint names. Silver coins of Sher Shāh are known from the Jahānpanāh-Ujjain Mint. This coin was acquired in Lāhore some years ago.

(iv) *Metal*, Silver. Pl. IV. 5.
Weight, 44 grains.
Mint, Lāhore.
Date, 987 A.H.

The inscription on one side of this coin reads الله اکبر "Akbar is God" and not the usual اکبر الله "God is great." A four-anna piece with a similar legend was published by Dr. L. White King and Captain Vost in 1896 in the paper already referred to, but although it bore the same year, it was from the Ahmadābād Mint.

It has been stated by some writers, among them the late Mr. C. J. Rodgers, that in the thirtieth year of his reign, when Akbar founded a new religion, he changed the legends on his coins, his object apparently being that he should be looked upon and worshipped as God; and coins of the kind described above have been quoted as strengthening the assertion regarding the object he had in view. But, so far at least as these pieces are concerned, is it not more reasonable to suppose that the transposition of the words was due to a mistake in the dies which was almost immediately rectified, for if Akbar really intended to assume divine honours and to proclaim himself as God, surely these coins instead of being of the greatest degree of rarity, would be abundant even now, and the inscription would also have been found on coins of the higher denominations instead of being confined to four-anna bits?

(v) *Metal*, Silver. Pl. IV. 6.
Weight, 177 grains.
Mint, Lahore.
Date, 997 A.H.

The rupee is apparently unique, or at any rate extremely rare, by reason of the mint name appearing in the upper margin of the reverse. On this side, the name and titles of the king are given in a square with loops at the four scorners. The Kalima, with the usual accompaniment, appears on the obverse in a quadrilateral area with three curves in each side.

(vi) *Metal*, Silver.
Weight, 176 grains.
Mint, Urdū Zafar Qarīn.
Date, Alif = 1000 A.H.

This rupee, which is precisely similar to the mohur portrayed as Figure 79, Plate III, of the B.M. Catalogue, is probably unique. It is the only round rupee of Akbar discovered so far from the camp mint and of the year (1000) *alif*. It was acquired in Amritsar some years ago.

(vii) *Metal*, Silver.
Weight, 175 grains.
Mint, Ahmadnagar.
Date, 4-Ilāhī.

This rare coin is of rude fabric, and, in this respect, much resembles the rupees of Akbar from the Bairāt Mint. The legend on the reverse is—

ماه شهریور الهی
۴ احمد نکر
ضرب

The obverse has the inscription usual on Ilāhī rupees.

GEO. B. BLEAZBY.

33. *A Zodiacal Half-rupee.* Pl. V. 1.

A few days ago I came across in the Aḥmadābād bazar a zodiacal Leo half-rupee [Legend, normal: Date, Hijrī year wanting, regnal year 13; Mint, Aḥmadābād]. If this be, as it seems to me to be, a genuine specimen, it furnishes evidence, hitherto wanting, of the existence of zodiacal coins of that denomination. Imitation half-rupees, indeed, bearing representations of the signs of the Zodiac, are well known (See Br. Mus. Catal. Nos. 386-401), and these themselves, *quâ* imitations, may fairly be taken as proof more or less substantial of the currency of the original coins they counterfeit. Had there been no genuine half-rupees, it is hard to see why the so-called "imitations" should ever have been fabricated.

Beside the recently-discovered half-rupee, three full rupees of Leo type lie before me on the table at which I am now writing. Two of the three were evidently struck from one and the same die, but the third not less evidently from a die slightly different. On the two, for instance, the word زیور is written as ریور with no superscribed dot over the "ze" (Pl. V. 2), but on the third as زىور with no subscribed dots under the "ye" (Pl. V. 3). Also on the duplicates after the word شاه of Jahāngīr Shāh comes a small curved flourish distinctly to the left of the "hā"; but on the third we have a longer sprawl, not to the left at all, but directly above the "hā." The two are evidently indentical with the coin No. 385 figured on Plate XI of the Br. Mus. Catal., and there styled an "imitation rupee." If these be imitations, then the third (of the زىور type) is certainly genuine, and it is with this third specimen that the half-rupee agrees in every particular.

But, indeed, on what ground the Br. Mus. rupee No. 385 is adjudged to be an imitation I fail to apprehend. A complete statement of the differentiæ that serve to discriminate between a genuine Zodiacal muhr or rupee and the beautifully-executed "imitations," a statement more detailed, and thus more practically helpful, than the paragraph on pp. LXXXIII, f. of the Br. Mus. Catal., would, I feel sure, be very acceptable to the collectors of the coins of this fascinating series.

GEO. P. TAYLOR.

Aḥmadābād.

Note.—I take the opportunity to figure yet a third variety in which the word زیور is written without any dots (Pl. V. 4.) All three types appear to be equally genuine. I note also that on the two specimens of the "Cancer" rupee in my cabinet, the reverse legend of which is similar to that on the "Leo" rupee above mentioned, the word زیور also appears without dots.

H. N. WRIGHT.

34. *Some rare Mughal Coins.*

In the hope that the following coins from my collection may be of some interest to numismatists, I beg to offer some short descriptive remarks regarding them :—

(i) *Akbar.* Pl. V. 5.

Æ.
Weight, 306 grains.
Size, ·85.″
Mint, Sironj.

Obverse. In double circle with dots between.

سرونج
فلوس
ضرب

Reverse.

۳۸ الہے
ماه مهر

Date, Ilahi 38.
Month, Mihr (7th Persian month).

This is a new Mughal Mint. The coin was obtained in Bombay two years ago.

(ii) *Jahāngīr and Nūr Jahān.* Pl. V. 6.

Æ.
Weight, 176 grains.
Size, ·85.″
Date, 1035-21
Mint, Lāhore

Obverse.

ز نام
شـــــــاه
جهانگیر[بو]
۲۱ سکه د

Reverse.

بر نور
فزوده
ــــــــــے
نو ر جهان زد
بیگـــــــم
لا هوره ۳۵ [۱۰]

The legends on both obverse, and reverse of this rupee read downwards—omitting the regnal year 21 and Hijri year (10)35, —form the following couplet :—

Zi Nām-i-Shāh Jahāngīr tā buwad sikka-i-bar nur.
Fazūdah Nūr Jahān Begum ru-i-Lāhor.

(May the coin by the name of King Jahāngīr, remain with light;
And may the face of Lāhore be made by Nūr Jahān Begam bright).
i.e., may this coin which is struck at Lāhore remain for ever shining with lustre, both from King Jahāngīr, and his (Queen Consort) Begam Nūr Jahān.

This rare rupee was obtained by me at Aḥmadābād on my short visit to that city on 29th of January last. Rupees of Jahāngīr and Nūr Jahān from the Lāhore mint with legends forming a couplet are known. This is a new couplet altogether* :—

(iii) *Aurangzeb.* Pl. V. 7.

Æ.
Weight, 103 grains.
Size, ·7″
Mint Burhānpūr.

Obverse.
زیب
اورنگ [ہ]
ے
فلوس [شا]

Reverse.
برهانپور
سنہ ۹

A new mint of of Aurangzeb in copper, I got it at Burhānpūr some two years ago.

(iv) *A'lamgīr* II. Pl. V. 8.

Æ.
Weight, 105 grains.
Size, ·65.″
Date, 1171—4?
Mint, Machhlipatan.

Obverse.
مبارک
جلوس ۱۱۷۱

Reverse.
۴
ضرب
مچهلي پٹن

This is a new mint of A'lamgīr II. in copper. The name of the Emperor is not engraved on the coin, but the year helps us in assigning it to him.

Framji J. Thanawala.
Bombay.

*Note.—The reading of the interesting coin of Jahāngīr suggested by Mr. Thānawālā, appears capable of improvement.

Owing to the coin being somewhat worn, it is difficult to say with certainty what the couplet is. The following is given as an alternative suggestion.

Obverse. ز نام شاه جهانگیر تا شده پر نور
Reverse. فزوده نور جهان روے سکه لاهور

The words on the reverse read by Mr. Thānawālā as بیگم and زد are, I think, unmistakeably سکه and رو. Similarly, I do not think that the penultimate line of the obverse can be read as سکه د. The second letter is much more like a د than a ک, and it is followed by what is clearly a ه. The rhythm of Mr. Thānawālā's couplet also appears to be defective. Dr. Taylor of Ahmadābād, who has also seen the coin, has suggested that the last three words on the obverse read ابد بر نور. He would make the ه at the end of the penultimate line the last letter of the word شاه in the second line. It is true the ه of شاه is not visible elsewhere on the coin but the coin is very much worn to the left of شا where one would expect to find the letter ه. Also there is no "*alif*" on the coin, and as far as I can see no room for any.

H. N. Wright.

35. *Dāwar Bakhsh*. Pl. IV. 7.

The coins of this grandson of Jahāngir who occupied the throne of Dehli for three months as a stop-gap for Shāhjahān are so scarce that it is worth while chronicling any finds. A rupee of Lāhore mintage has been described and figured in the Catalogue of the British Museum (Moghul Emperors, No. 527). A second was contained in the collection of the late Pandit Ratan Narāin of Delhi, and the coin described below, which was obtained by me at Meerut in March last, is, I believe, the only other known. All three are identical in legend. No gold coins of Dāwar Bakhsh have apparently come to light yet, but doubtless some were struck.

AR
Weight 172 grains.
Size, ·85.
Mint, Lāhore.
Date, 1037 A.H. Ahd.

Obverse.	*Reverse.*
الله	بادشاه
لا اله الا	بخش
١٠٣٧ محمـــــــــد	داور
رسول الله	المظفر
ضرب	ابو سنة احد
لاهور	

The coin, but for three shroff marks on one side and four on the other, is in very good condition.

H. N. Wright.

36. *Two rare coins of Shāhjahān and Aurangzeb.*

Among 246 silver coins recently acquired as treasure-trove in the district of Bhandāra C.P., and sent to me for examination, two are of sufficient rarity to warrant special notice. One is a coin of S͟hāhjahān of Katak mint but of a new type; the second of Aurangzeb, struck at the Town of Allahābād. This latter is, I believe, one of two known, the other having been presented to me some years ago by my friend Dr. G. P. Taylor of Ahmadābād. It has not, however, been previously described.

(i) *S͟hāhjahān.* Pl. IV. 8.

Æ
Weight, 173 grains.
Size, ·9.
Mint, Katak (Cuttack).
Date, 3rd regnal year. Month Abān.

Obverse.	*Reverse.*
لا اله الا الله	غازے
محمد	جهان بادشاه ∴
رسول الله	اه
ابا نماه الهے	محمد صاحبقران ثانے
ضرب کتک	شهاب الدین

(ii) *Aurangzeb.* Pl. IV. 9.

Æ
Weight, 174 grains.
Size, ·9.
Mint, Town of Allahābād.
Date, 1072. A.H. 4th regnal year.

Obverse.	*Reverse.*
Usual couplet but	بلدة اله آباد
مهر *vice* بدر	ضرب
date to left of	جلوس میمنت مانوس
lower line.	سنة ۴

H. N. Wright.

37. *Note on Kām Bakhsh and Bahādur Shāh.*

I notice on p. 241 of the Journal, Vol. LXXII, Part I, for 1904, a statement by Mr. H. N. Wright that "Kām Bakhsh was made Governor of the Ṣūbahs of Bijāpur and Ḥaidarābād by his brother, Shāh 'Ālam Bahādur" [should be S.'A., Bahādur *Shāh*]. I do not think that such an error,[1] coming from a leading numismatist, should be allowed to pass without a protest. The mere fact that Kām Bakhsh issued coin in his own name suffices to show that he claimed sovereignty.

Kām Bakhsh never held his authority from Bahādur Shah; he was either an independent sovereign, as his father intended, or a rival who had usurped part of Bahādur Shah's kingdom. By his alleged will 'Ālamgir attempted to make a partition of the country between his three surviving sons; and it was in pursuance of this design, no doubt, that on the 14th Zū,l Qa'dah 1118 H. (17th February, 1707 N.S.), he nominated Kām Bakhsh to be Governor of Bijāpur and Ḥaidarābād. Kām Bakhsh started from the court at Aḥmadnagar at once to take up his appointment. 'Alamgir died on the 2nd March, 1707 (N.S.)

The exact words used in the will, as translated by James Frazer "Nadir Shāh," p. 36, are: "Whoever of my fortunate children "shall chance to rule the empire, let him not molest Mahommed "Kām Bakhsh, should he rest content with the Two New Ṣūbāhs." The text from which James Frazer translated was, apparently, that now in the Bodleian Library, *see* Sachau and Ethe's "Catalogue of Persian MSS." No. 1923 (Frazer MSS. No. 118) fol. 13a.

After doubting for a long time, I have at last come to look on this will as authentic. Khāfi Khan, II, 549, says it was made over to Ḥamid-ud-dīn Khān, a confidential servant in the Emperor's entourage; Kāmwar Khan states that 'Ālamgīr kept it, after signature, under his pillow. Immediately after 'Ālamgīr's death, its provisions were appealed to by Bahādur Shāh when writing early in June, 1707 to his brother A'zam Shāh, then advancing on Āgrah to contest the succession; and a copy had reached Sūrat as early as the 18th October, 1707, as may be seen from F. Valentyn, Oude en Nieun ost Indie," IV, 274. The probabilities are in favour of the document having been executed;

---

[1] The statement quoted above was based on the following extract from the *Muntakhabu-i-lubāb* (Text Vol. II. p. 605) as translated by Professor Dowson (Elliot's History of India, Vol. VII, p. 405).

"A kind and admonitory letter was addressed by the Emperor (Shāh 'A'lam I) to his brother Prince Muḥammad Kām Bakhsh to the following effect: 'Our father entrusted you with the government of the *Ṣūba* of Bījāpūr; we now relinquish to you the government of the two ṣūbas of Bījāpūr and Ḥaidarābād, with all their subjects and belongings, upon the condition, according to the old rule of the Dakhin, that the coins shall be struck and the *khuṭba* read in our name. The tribute which has hitherto been paid by the Governors of these two provinces we remit.'

H. N. Wright.

and in any case, the dates show that Kām Bakhsh was appointed to, and started to take possession of, Bijāpur before his father's death.

William Irvine.

38. *Aḥmad Shāh Bahādur. A new Mughal mint. Mujāhidābād.*

This coin was obtained by me in Cawnpore two years ago. I have been unable to identify the locality of Mujāhidābād. Aḥmad Shāh at his accession took the title of Mujāhid-ud-dīn (Elliot, VIII., p. 112.).

The mint is entered in Mr. Burn's list of Mughal Mints (J.A.S.B., Pt. I., No. 2, of 1904) but the coin has been nowhere described.

AV. Pl. IV. 10.
Weight, 165 grains.
Size, ·85.
Mint, Mujāhidābād.
Date, 1163, A.H. 3rd regnal year.

Obverse.	*Reverse.*
Within dotted circle.	Within dotted circle.
احمد شاه بهادر ے	مانوس
بادشاه غاز ک	میمنت
سکه مبار	سنة ۳ جلوس
	ضرب
	مجاهداباد

H. N. Wright.

39. *A find of coins at Manbhūm.*

A large and interesting find, containing 540 coins, from Shāhjahān I to Shāh Alam II was recently made at Ghorati in the Manbhūm district. The find was especially rich in the Bengal and Benāres mintages of the later Mughals, Muḥammad Shāh, Aḥmad Shāh, 'Alamgīr II and Shāh 'Alam II as the following figures will shew :—

	Muḥammad Shāh	Aḥmad Shah	'Alamgīr	Shāh 'Alam II.
Azimābād ...	39	10	31	5 = 85
Jahāngīrnagar	1	...	7	5 = 13
Katak ...	1	...	...	= 1
Muḥammadābād Benāres	26	33	123	31 = 213
Murshidābād	17	20	31	1 = 69
Mūngīr	...	...	...	2 = 2
				383

Of the Muḥammadābād Benāres Mint there were coins of the 16th regnal year, and of each regnal year from the 18th to the 30th of Muḥammad Shāh, a complete series of the coins of Aḥmad Shāh and 'Álamgīr II, and coins of the first five years of Shāh 'Ālam II. The latter coins and those of 'Ālamgīr II shew a great variety of types and mint marks. The find also contained a complete series of the rupees of Aẓāmābād for the reigns of Aḥmad Shāh and 'Ālamgir II, except in respect of the 4th year of the former sovereign; and it appears from them that the mint-mark identified with the Aẓīmābād Mint in later times was first placed on the coins in 1163 A.H.—the 3rd year of Aḥmad Shāh. Rupees of Katak of Muḥammad Shāh, of Jahāngīrnagar of Muḥammad Shāh, and 'Ālamgir II, and of Mūngīr of Shāh 'Ālam II have not, as far as I know, been previously found.

The find further contained a rupee of 'Ālamgīr II of Calcutta mintage, a rupee of Shāh Ālam II of Allahābād, with a date which, it seems to me, must be read as 1172 A.H., *i.e.*, two years before he ascended the throne of Dehli; and a rupee of Shāh Jahān III of Aẓimābād, dated 1174 A.H.

The Mūngīr rupee of Shāh 'Ālam II calls for special notice. In Dr. White King and Captain Vost's paper "Some Novelties in Moghul Coins," published in the Numismatic Chronicle, Vol. XVI, a dām of Akbar was described and figured, on which the mint name Mānghīr مانگہیر was read, though no 'ye' is visible in the illustration of the coin. This place was identified with Monghyr in Bengal. The latter, however, is always in Persian characters spelt مونگیر, and this is the spelling found on the coin of Shāh 'Ālam II in the Manbhūm find. It seems certain, therefore, that the mint town of the copper coin of Akbar above mentioned cannot have been Monghyr in Bengal. It is more probable that it was "Mānghar," a fort built by Islām Shāh Sūrī, 76 miles north of Amritsar (see Thomas's Chronicles, page 414). This would account for the Sūrī type of the reverse.

The Allahābād rupee of Shah 'Ālam II, dated 1172 A.H., is puzzling. It is, I understand, not the first found, but I have myself seen no other. In Elliot and Dawson's History of India, Vol. VIII, page 172, it is stated that in the 5th year of 'Ālamgīr's reign, which would correspond to 1172-73 A.H., Shāh 'Ālam left Dehli after fighting a battle with Ghāzī-ud-din Khān and proceeded eastward. He was joined by the Governor of Allahābād, and proceeded to invade Bengal, with a view to "establishing his claim to the viceroyalty of the eastern Sūbahs" (Br. Mus. Cat., page 12). After his defeat at Buxar and the signing of the Treaty of Allahābād in 1765 A.D. (1178-79 A.H.) the latter place became the headquarters of Shāh 'Ālam for some years.

(i) *Muḥammad Shāh.* Pl. IV. 11.

Æ.
Weight, 179 grains.

Size, ·9.
Mint, Katak.
Date, **1154**—24th regnal year.

Obverse. ۱۱۵۴ محمد شاه بادشاه غازي سکه مبارک

Reverse. سنه ۲۴ جلوس میمنت مانوس ضرب کتک

(ii) *'Ālamgir Shāh II.* Pl. IV. 12.

AR.
Weight, 179 grains.
Size ·9
Mint, Jahāngīrnagar.
Date 117—6th regnal year.

Obverse. ۱۱۷ عالمگیر بادشاه غازي سکه مبارک

Reverse. سنة ۶ جلوس میمنت مانوس ضرب جهانگیر نگر

(iii) *'Ālamgir Shāh II.* Pl. IV. 13.

AR.
Weight, 179 grains.
Size, 1″.
Mint, Calcutta.
Date, 1172—5th regnal year.

Obverse. عالم گیر بادشاه غازي سکه مبارک ۱۱۷۲

Reverse. سنه ۵ جلوس میمنت مانوس ضرب کلکته

Mint mark:
On obverse—"Sun,"
On reverse—"Cinquefoil" (traces of).

(iv) *Shāhjahān III.* Pl. IV. 14.

AR.
Weight, 179 grains.
Size, ·9.
Mint, Azīmābād.
Date, 1174—Ahd.

Obverse. شاه جهان بادشاه غازي سکه مبارک ۱۱۷۴

Reverse. ضرب عظیم‌اباد سنه احد جلوس میمنت مانوس

(v) *Shāh 'Ālam II.* Pl. IV. 15.

AR.
Weight, 180 grains.
Size, ·95.
Mint, Mūngir (Monghyr).
Date, **1176**—4th regnal year.

Obv.	*Rev.*
حامي دين محمد سايه فضل اله سكه زد بر هفت كشور شاه عالم بادشاه ١١٧٦	مانوس * ميمنت سنه ۴ جلوس ضرب مونگير

(vi) *Shāh 'Ālam II.* Pl. IV. 16.

Æ.
Weight, **179** grains.
Size, ·9.
Mint, Allahābād.
Date, **1172** (?)—Ahd.
Obverse. شاه عالم بادشاه غازي سكه مبارك ١١٧٢
Reverse. سنه احد جلوس ميمنت مانوس ضرب الهاباد

H. N. WRIGHT.

40. *Two double rupees of Sūrat Mint.*

Mr. R. F. Malabārwālā, of Bombay, has sent me for publication a double rupee of the Sūrat Mint struck in the name of Alamgir II. The Hijra date is unfortunately wanting, but the regnal year on the reverse fixes it as **1176** or **1177**. Below is a description of the coin. As far as I know, the only other double rupee known is the one in the cabinet of Dr. G. P. Taylor of Aḥmadābād, which he has kindly permitted me to describe in this note.

Rupees of the type of the Sūrat rupee of the Moghul Emperors were coined by the Bombay Mint. Mr. Thurston in his History of the East India Company's Coinage says (page 43): "The Nawāb's rupees, however, were soon found to contain **10**, **12** or even **15** per cent. of alloy, in consequence of which the Bombay rupees were melted down and recoined at Sūrat. The coinage of silver in the Bombay Mint was suspended for twenty years, and the Sūratis alone were seen in circulation. At length in **1800** (**1214** A.H.) the Company ordered the then Sūrat rupee to be struck at Bombay." As both the present rupees were issued before **1780** A.D. (**1194** A.H.) it cannot be definitely stated whether they were struck by the Mughal Emperors whose names they bear or issued from the Bombay Mint.

(i) (G. P. T.) Pl. V. 9.

Æ.
Weight, **349** grains.
Size, 1·0.
Mint, Sūrat.

Date, [1172] 5th regnal year.
M.M., ع in the س of جلوس

Obv.	*Rev.*
عالم گیر ے ک بادشاه غاز سکة مبار	مانوس میمنت سنة ٥ جلوس ضرب سورت

(ii) (R. F. M.) Pl. IV. 10.

Æ.
Weight, 350 grains.
Size 1·0.
Mint, Sūrat.
Date, [1176] 4th regnal year.
M.M., seven petalled flower in the س of جلوس

Obv.	*Rev.*
شاه عالم ے ک بادشاه غاز سکة مبار	مانوس ٤ میمنت سنة جلوس ضرب سورت

H. N. Wright.

41. “*Mumbai-Sūrat*” (ممبی سورت) or “*Mahīsūr* (مہی سور) *which ?*

Grave doubt should, it seems to me, be entertained regarding the existence of the so-called “Mumbai-Surat” Mint. And for the following five reasons:—

1. The only coin attributed to this mint is the *quarter*-rupee registered as No. 80 on page 280 of the British Museum “Catalogue of Indian Coins, Moghul Emperors.”

2. Neither element of this compound-name, “Mumbai-Sūrat,” can be regarded as an adjectival epithet subordinate to the other element. We have here co-ordination pure and simple, produced by the mere juxtaposition of the names of two distinct mint towns. In the long list of the Mughal Mints in India I can recall no other instance of a name built up in this agglutinative fashion.

3. If the legend given in the British Museum Catalogue is true to the original, then amongst contemporary coins this quarter-rupee is exceptional in recording the name of its mint *simpliciter*, without the prefixed term “ḍarb,” ضرب

4. The crescent symbol here present, when found on other coins of this period, is held to be a mint-mark distinctive of the

French Compagnie des Indes. Now, in the 45th regnal year of Shāh 'Ālam II $\frac{\text{A.H. } 1218}{\text{A.D. } 1803\text{-}4}$, the year of the issue of this quarter rupee, France was still a belligerent power, harbouring hostile designs against British India. It is thus well-nigh incredible that any coin struck in that year by the English at either Bombay on Surat, cities remote from the sphere of French influence, should bear this acknowledged symbol of French ascendency.

5. An autotype representation of the quarter-rupee is included in Plate XXXI of the British Museum Catalogue; but the mint-name as there shown—at least in my copy—does *not* admit of decipherment as Mumbai-Sūrat.

Rejecting for the above reasons the British Museum version, I venture to submit the following as the true rendering of the legend that is contained, so far as the plan admits, on the reverse of this coin:—

مانوس
میمنت
سنه ں ۴۵ جلوس
ضرب
مهي سور

If this reading be correct, the quarter-rupee was struck at the Mahīsūr (Mysore) Mint. At Mysore the French held a dominant position till the fall of Seringapatam in 1799, and doubtless the crescent on this coin of 1803-4 stands as a survival from that earlier period of power.

A comparison of this quarter-rupee (No. 80) with the Pondicherry and Machhlīpatan rupees (Nos. 128 and 143) reveals the fact that all three are of the same (French) type, bearing not only the crescent symbol, but an identical obverse impression. In all the arrangement of the words of the legend is precisely the same, and the row of diamond-shaped clusters, each of four dots, is a distinctive feature of the field.

The Lāhor Museum Catalogue registers a full rupee of Mahīsūr, dated the 47th year of Shāh 'Ālam II, but unfortunately the description given of this rupee is imperfect. It would be interesting to examine the coin anew, and see whether in type and make it is allied to the "Mumbai-Sūrat" quarter-rupee.

Query:—In the L. M. Catal. Rodgers's brief note reads:—

"Year ۷۴ع (for ۴۷) and mint مهي سور." May this ۷۴ع (?=۴۷. . . .) stand for the regnal year "4*x*" preceded by a rudely formed or misshapen crescent?*

Geo. P. Taylor,
Ahmadābād.

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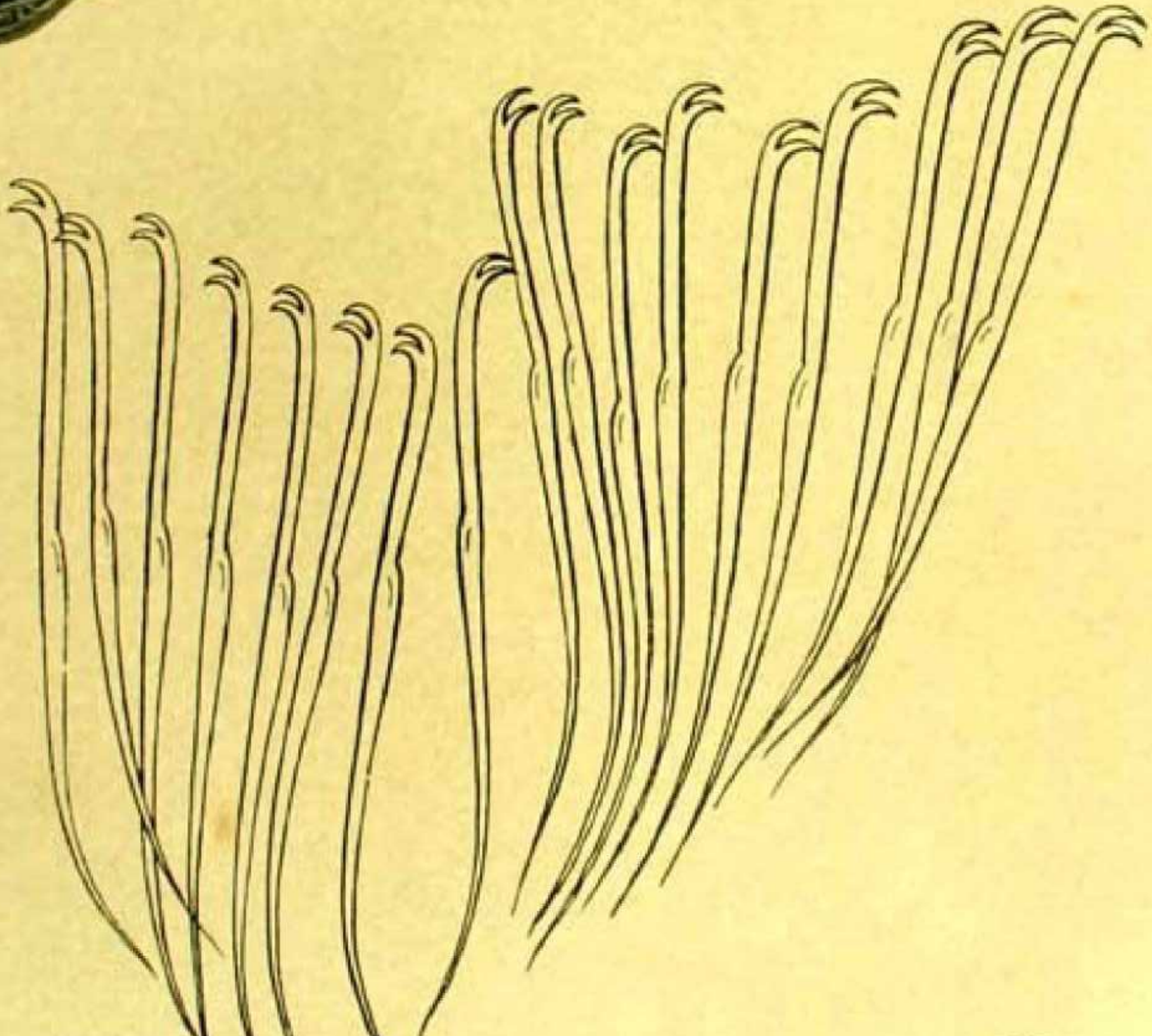
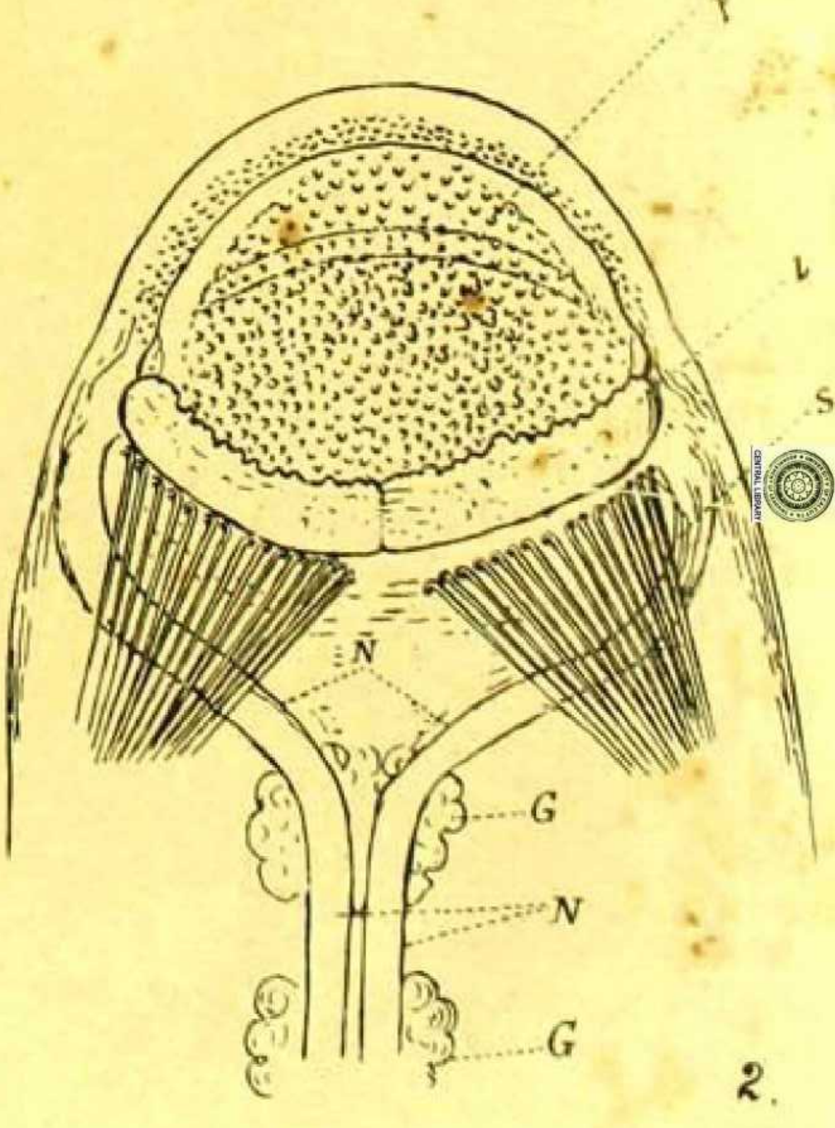
* I have ascertained from Lāhor that the reverse of this coin bears the crescent symbol to the left of ۷۴ع.—H. N. W.

1.



4

3.



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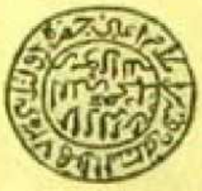
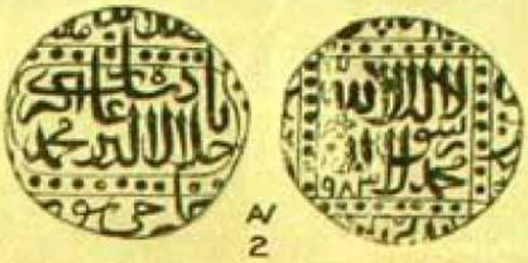
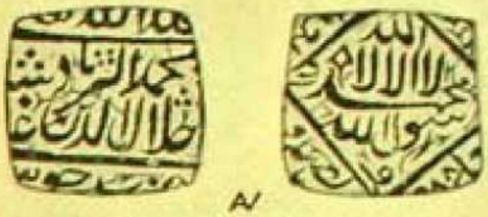


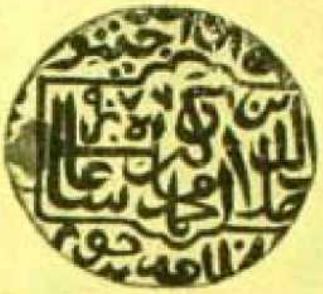
AV
1



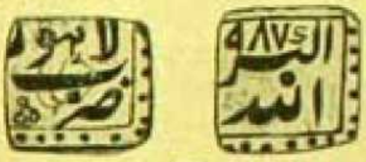
AV
2



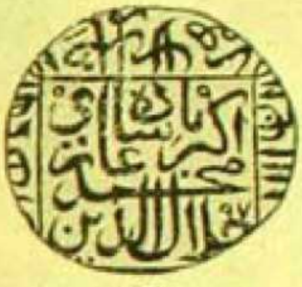
AV
3



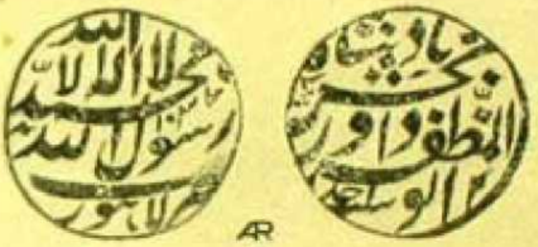
AR
4



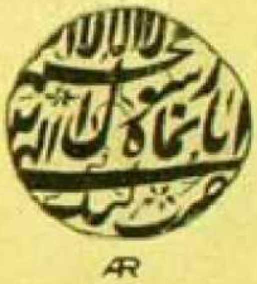
AR
5



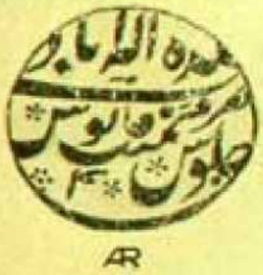
AR
6



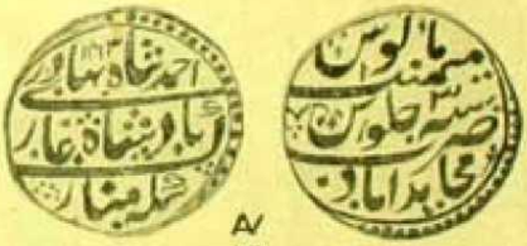
AR
7



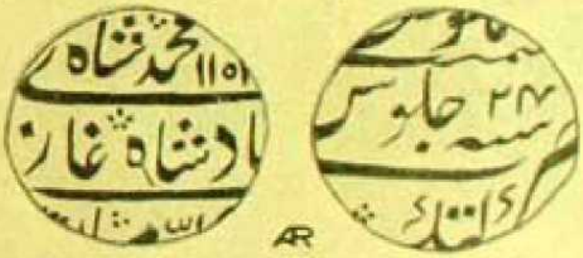
AR
8



AR
9



AV
10



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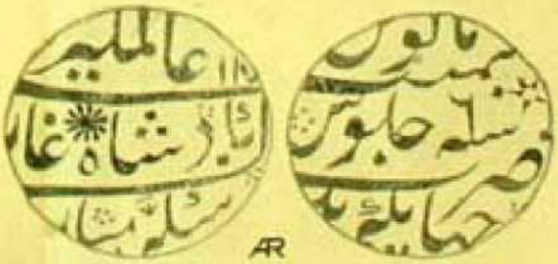

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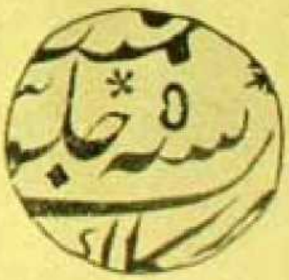

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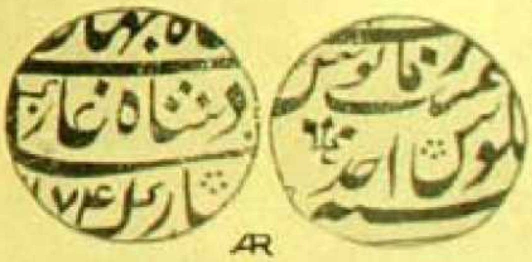

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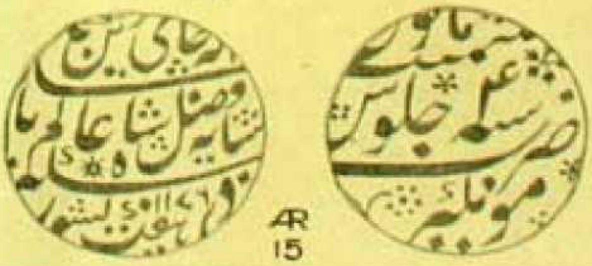

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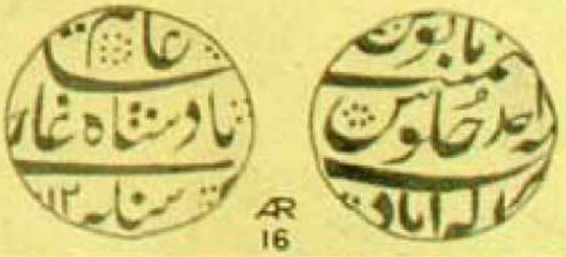

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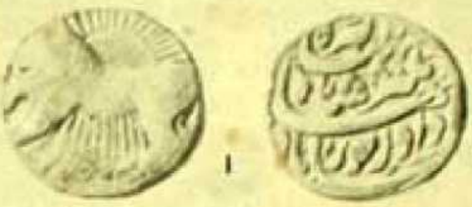
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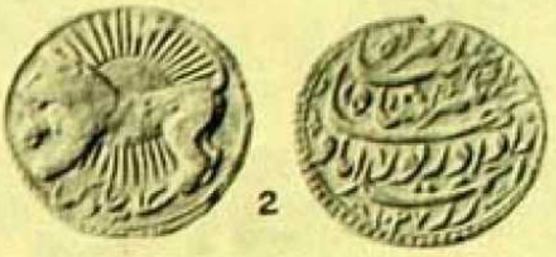
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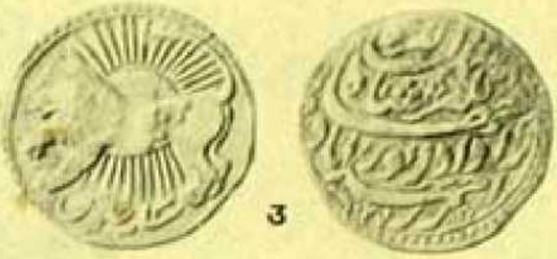
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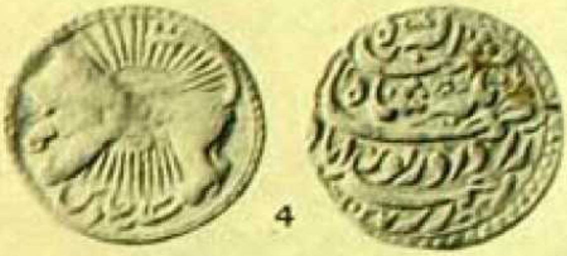
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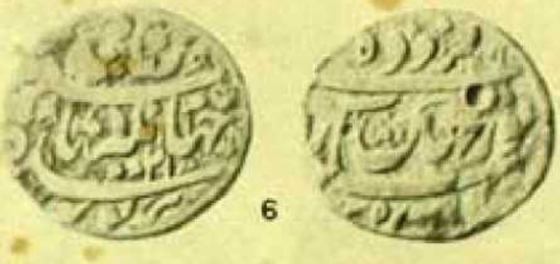
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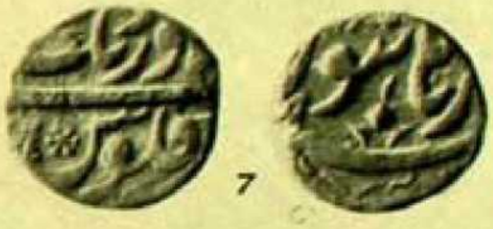
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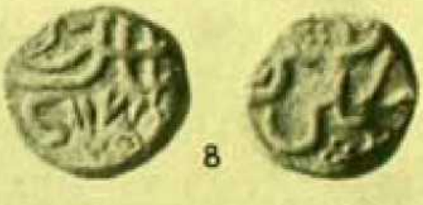
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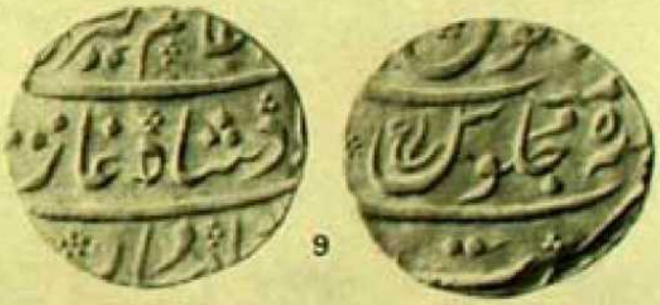
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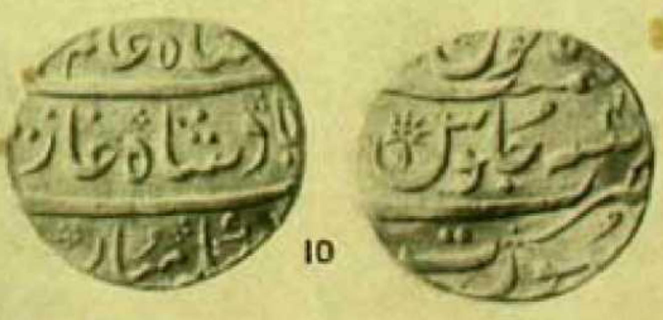
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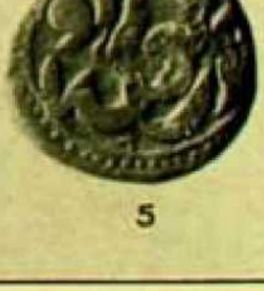
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LIBRARY.

The following new books have been added to the Library from May to June 1905.

Anavamadarsī Saŋgharāya. Daivajña Kāmadhenu, a treatise on Astrology…Edited by the Very Rev. C. A. Seelakkhandha… and Seetarama Upadhyaya. Fasc. I, *etc. Benares*, 1905, *etc.* 8°.

Benares Sanskrit Series, No. 97.

Aŋgirā AND OTHERS स्मृतीनां समुच्चयः। [A collection of twenty-seven Smṛtis of Aŋgirā…Edited by the Pandits of Ānandāśrama.] [*Poona*, 1905.] 8.°

ARCHÆOLOGY. Annual Report of the Director-General of Archæology, 1903-04, Part I, *etc. Calcutta*, 1905, *etc.* fol.

Presd. by the Director-General of Archæology.

Balaji Sitaram Kothare. Hindu Holidays, as originally contributed to "The Times of India." *Bombay*, 1904. 8°.

BENARES.—*Sanskrit College.* List of Sanskrit, Jaina and Hindi Manuscripts purchased by order of Government and deposited in the Sanskrit College, Benares, during 1902. Nos. 6 & 7. *Allahabad*, 1904. 8°.

Presd. by the Govt. of the United Provinces.

BOARD OF EXAMINERS. Catalogue of books in European Languages in the Library of the Board of Examiners, late College of Fort William. Prepared under the superintendence of Lieut.-Col. Ranking. [With two indices.] 3 pts. *Calcutta*, 1903. 4°.

————Catalogue of books in Oriental Languages in the Library of the Board of Examiners, late College of Fort William. Prepared under the superintendence of Lieut.-Col. Ranking. [With two indices.] 3 pts. *Calcutta*, 1093. 4°.

Presd. by the Board of Examiners, Fort William.

BUENOS AIRES. Demografia. Año 1901, *etc. La Plata*, 1904, *etc.* 8°.

Presd. by the Direccion-General de Estadistica, Buenos Aires.

Cotton, Julian James. List of inscriptions on Tombs or Monuments in Madras, possessing historical or archæological interest. *Madras*, 1905. fol.
Indian Monumental Inscriptions, vol. 3.

Presd. by the Government of Madras.

EARLY Dutch and English Voyages to Spitsbergen in the seventeenth century, including Hessell Gerritsz. "Histoire du Pays nommé Spitsberghe," 1613, translated into English ...by B. H. Soulsby...and J. S. Van der Brugge. "Journael of Dagh Register" Amsterdam, 1634. Translated into English ...by J. A. J. de Villiers...Edited with introductions and notes by Sir W. Martin Conway. *London*, 1904. 8°.
Hakluyt Society's Publications, 2nd Series, No. 11.

Presd. by the Govt. of India, Home Dept.

FAUNA OF BRITISH INDIA, including Ceylon and Burma...Butterflies, Vol. I. by Lieut.-Col. C. T. Bingham.
London, 1905. 8°.

Presd. by the Govt. of Bengal.

Haas, W. R. Tromp de. Uitkomsten van de aftappingsproeven met Hevea Brasiliensis in den Cultuurtuin te Tjikeumeuh gedaan gedurende de jaren 1900, t/m, 1904, *etc.*
Batavia, 1905, *etc.* 8°.

Presd. by the Botanic Institute of Buitenzorg.

HAKLUYT SOCIETY. Prospectus and List of Members, 1904.
London, [1905.] 8°.

resd. by the Govt. of India, Home Dept.

Herzog, Maximilian. The Plague: Bacteriology, Morbid Anatomy, and Histopathology, including a consideration of insects as plague carriers. *Manila*, 1904. 8°.
Bureau of Govt. Laboratories, Manila, No. 23.

Presd. by the Bureau.

Holdich, *Colonel Sir* Thomas Hungerford. India...With maps and diagrams. *London*, 1904. 8°.
Part of "The Regions of the World," edited by H. J. Mackinder.

James, S. P. and **Liston,** W. Glen. A Monograph of the Anopheles Mosquitoes of India. *Calcutta*, 1904. 4°.

Kalidasa. Kalidasa's Abhijñanashakuntalam. Translated in English verse by Kalikes Bandyopadhyay. *Calcutta*, 1901. 8°.

Presd. by the Author.

Koehler, R. and **Vaney,** C. An Account of the Deep-Sea Holothurioidae collected by the Royal Indian Marine Survey Ship *Investigator*. *Calcutta*, 1905. 4°.

Presd. by the Indian Museum.

LINGUISTIC SURVEY OF INDIA. Report on the Progress of the Linguistic Survey of India, presented to the Fourteenth International Congress of Orientalists. [By Dr. G. A. Grierson.] [1905.] fol.

Presd. by the Author.

MANILA.—*Bureau of Forestry.* Report of the Chief of the Bureau of Forestry of the Philippine Islands for the period from September 1, 1903 to August 31, 1904. *Manila*, 1905. 8°.

Presd. by the Chief of the Bureau of Forestry, Manila.

Mann, Harold H. Agriculture as a science. A lecture, *etc.* [*Calcutta*, 1905.] 8°.

Presd. by the Calcutta University Institute.

Maxwell-Lefroy, H. The Dusky Cotton Bug. The Red Cotton Bug. The Cotton Leaf Hopper. The Success Knapsack Sprayer. The Six-Spotted Lady Bird Beetle. A Simple Spraying Apparatus. The Preservation of Seed from Insect Attacks. Rosin Washes as Insecticides. Kerosene Emulsion. Crude Oil Emulsion. Lead Arseniate. [*Bombay*, *Pusa*, 1904-05.] 8°.

Presd. by the Author.

Meldola, Raphael. The Chemical Synthesis of Vital Products and the inter-relations between organic compounds. *London*, 1904. 8°.

Merrill, Elmer D. A Review of the identifications of the species described in Blanco's Flora de Filipinas. *Manila*, 1905. 8°. *Bureau of Government Laboratories, Manila No. 27.*

Presd. by the Bureau.

Moore, F. Lepidoptera Indica. 5 vols. *London*, 1890-93. 4°.

Nevill, H. R. District Gazetteers of the United Provinces of Agra and Oudh, vol. xxxiv. Naini Tal, vol. xli. Hardoi, vol. xlviii. Bara-Banki. *Allahabad*, 1904. 8°.

Presd. by the Government of India, Home Dept.

S'aunak. The Bṛhad-devata attributed to S'aunaka. A summary of the deities and myths of the Rig-veda. Critically edited in the original Sanskrit with an introduction and seven appendices and translated into English with critical and illustrative notes by A. A. Macdonell. 2 pts. *Cambridge, Mass.* 1904. 8°.

Harvard Oriental Series, vols. 5 & 6.

Presd. by the Harvard University.

Waddell, *Lieut.-Col.* L. Austine. Lhasa and its Mysteries. With a record of the expedition of 1903-1904....With...illustrations and maps. *London*, 1905. 8°.

Wehrli, Hans J. Beitrag zur Ethnologie der Chingpaw (Kachin) von Ober-Burma. *Leiden*, 1904. 4°.
Internationales Archiv für Ethnographie Supplement zu Bd. XVI.

Wherry, Wm. B. Glanders: Its diagnosis and prevention. Together with a report on two cases of human glanders occurring in Manila, and some notes on the Bacteriology and Polymorphism of Bacterium Mallei. *Manila*, 1904. 8°.
Bureau of Government Laboratories, Manila, No. 24.

Presd. by the Bureau.

MAY, 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 3rd May, 1905, at 9-15 P.M.

PANDIT SATIS CHANDRA VIDYABHUṢAṆA, M.A., in the chair.

The following members were present :—

Dr. N. Annandale, Rai Sarat Chandra Das, Bahadur, Mr. L. L. Fermor, Mr. J. Macfarlane, Mr. F. C. Turner, Mr. E. Vredenburg.

Visitor :—Mr. G. de P. Colter.

The minutes of the last Meeting were read and confirmed.

Thirty-six presentations were announced.

Babu Kashi Prasad Saha, Babu Hemendra Prasad Ghosha, Dr. A. J. Ollenbach, Mr. H. G. Graves, Babu Dwarkanath Chakrabutti and Mr. T. W. Richardson were balloted for and elected Ordinary Members of the Society.

It was announced that Mr. A. Tocher had expressed a wish to withdraw from the Society.

The Chairman announced that Mr. H. E. Stapleton, Captain L. Rogers, I.M.S., Mr. H. H. Mann, Mr. D. Hooper and Mr. J. N. Das Gupta had been appointed to serve on the Library Committee during the present year.

The following papers were read :—

1. *The Emperor Bābar.—By* H. BEVERIDGE, I.C.S. (retired.)

2. *Contributions to Oriental Herpetology III—Notes on the Oriental Lizards in the Indian Museum, with a List of the Species recorded from British India and Ceylon. Part 2.—By* NELSON ANNANDALE, B.A., D.Sc.

3. *Tibet, a dependency of Mongolia* (1643-1716 A.D.)—*By* RAI SARAT CHANDRA DAS, BAHADUR, C.I.E.

4. SARVAJÑA-MITRA—*A Tantrika Buddhist author of Kāśmīra in the 8th Century A.D.—By* PANDIT SATIS CHANDRA VIDYABHUṢAṆA, M.A.

5. *The Similarity of the Tibetan Alphabet to the Kashgar Brahmi Alphabet.—By* REV. A. H. FRANCKE.

6. *A complete All-word Index to the Inscriptions of Asoka.—By* GANGA MOHAN LASKAR, M.A. *Communicated by the Philological Secretary.*

The last two papers will be published in the Memoirs.

7. *Materials for a Flora of the Malayan Peninsula, No. 16.*—*By* SIR GEORGE KING, K.C.I.E., LL.D., F.R.S., *late Superintendent of the Royal Botanic Garden, Calcutta, and* J. SYKES GAMBLE, C.I.E., M.A., F.R.S., *late of the Indian Forest Department.*

(Abstract.)

The present contribution to these materials contains the account of the genus *Psychotria* required to conclude the joint-account by the authors of the natural order *Rubiaceæ*, commenced in part 14 and continued in part 15 of this series. This account of *Psychotria* comprises descriptions of 26 completely represented and 3 imperfectly known species; of these the following 11 species,—*Psychotria Kunstleri* King & Gamble, *P. Scortechinii* King & Gamble, *P. pilulifera* King & Gamble, *P. Ridleyi* King & Gamble, *P. multicapitata* King & Gamble, *P. Birchiana* King & Gamble, *P. fulvoidea* King & Gamble, *P. Curtisii* King & Gamble, *P. Wrayi* King & Gamble, *P. inæqualis* King & Gamble, and *P. condensa* King & Gamble, are new to science.

In addition, this fasciculus contains accounts, for which the authors are jointly responsible, of the three following natural orders: *Campanulaceæ*, 4 genera and 6 species, two of the species—*Pentaphragma Scortechinii* King & Gamble and *P. Ridleyi* King & Gamble,—being new; *Vacciniaceæ*, 3 genera and 12 species, 5 of the species—*Pentapterygium Scortechinii* King & Gamble, and *Vaccinium Scortechinii* King & Gamble, *V. glabrescens* King & Gamble, *V. viscifolium* King & Gamble and *V. Kunstleri* King & Gamble,—being new; and *Ericaceæ*, 5 genera and 17 species, 1 genus—*Pernettyopsis* King & Gamble,—and 7 species—*Diplycosia erythrina* King & Gamble, *Rhododendron Wrayi* King & Gamble, *R. pauciflorum* King & Gamble, *R. perakense* King & Gamble and *R. dubium* King & Gamble, with *Pernettyopsis malayana* King & Gamble, and *P. subglabra* King & Gamble—being new to science.

Two orders; *Valerianaceæ*, 1 genus and 1 species; also *Compositæ*, 23 genera and 31 species, have been described by Sir G. King: four others; *Stylideæ*, 1 genus and 1 species; *Goodenovieæ*, 1 genus and 1 species; *Epacrideæ*, 1 genus and 1 species; and *Plumbagineæ*, 2 genera and 2 species, have been described by Mr. Gamble. These six orders contain no novelties.

In addition to the foregoing, an account of the order *Monotropeæ*, 1 genus and species, has been provided by Lieut.-Col. D. Prain, Superintendent of the Royal Botanic Garden, Calcutta; while Mr. C. B. Clarke, F.R.S., formerly President of the Linnean Society, has prepared an account of the natural order *Gentianaceæ*, 6 genera and 8 species, 1 genus—*Microphium* C. B. Clarke,—and 3 species,—*Microphium pubescens* Clarke, *Cancora pentanthera* Clarke, and *Villarsia aurantiaca* Ridley—being new to science.

This paper will be issued as an extra number of the Society's *Journal*, Vol. LXXIII, Part II., 1904.

15. *The Emperor Bābar—By* H. BEVERIDGE, I.C.S. (retired.)

As everything relating to Bābar is interesting, I shall here set down a few things about him which are not mentioned in Erskine and Abul Faẓl. The most important is a tradition which is still current in Bābar's native country of Farghāna, and which is recorded in the "History of the Khanate of Khokand (*i.e.*, Farghāna) by Vladimir Petrovitch Nalivkine, a translation of which by Aug. Dozon was published at Paris in 1889. The author, after stating in his preface that the Memoirs of Bābar are nearly unknown in Farghāna or by the Sarts, and that Bābar himself has a bad reputation in that country, says, at p. 63, that when Bābar hurriedly evacuated Samarkand in 918 A.H. (1512 A.D.), after his defeat by the Uzbegs, Saizida Āfāq, one of his wives, who was accompanying him in his flight, was seized by the pangs of child-birth in the desert which extends from Khojand to Kandbadām (east of Khojand and north of Isfava) and gave birth to a son. Bābar dared not tarry, and so the infant was wrapped up and left under some bushes. As a token of whose child he was, and as a reward to the finder, Bābar fastened round the babe his girdle which contained things of price. The child was found by natives of the country, and in allusion to the valuables which were beside him they gave him the name of Altyn Bishik or, "The golden cradle." Afterwards he received three other names *viz.*, Qultuq (the armpit?), Khān Tangriyār (the friend of God), and Khudāyān Sulṭān. It was by the last of these names that he was generally known in after life. Altyn Bishik grew up and spent most of his life at Akshī, one of the capitals of Farghāna. He was a disciple of the famous saint Makhdūm Ā'aẓam who was a native of Kāsān, and whose real name was Aḥmad Khwājagī Kāsānī. Several saints of the name of 'Makhdūm Ā'aẓam are mentioned in Shaw's history of the Khojas, A.S.B.J. Supp. for 1897, but the one referred to in the tradition before us is the Makhdūm Ā'aẓam who was a friend of Bābar and who died in 949 A.H. (1542 A.D. He lived chiefly at Samarkand, and is buried near there, at Dakhbid. Shortly before his death he came to Akhsī and saw his disciple Altyn Bishik and his son who also had the name of Tangrīyār and was then 5 or 6 years old. Altyn Bishik died in 952 A.H. (1545 A.D.), and his grandson Yār Muḥammad went off to India, to his relations, the descendants of Bābar.

The same tradition is told, with some differences, by Niyāz Muḥammad Khokandī in his Persian work the *Tārīkh-i-Shahrukhi*, *Pantusov*, Kazan, 1885. With regard to the above tradition, which is probably genuine, it may be noted that an Āfāq Begam, a grand-daughter of Sulṭān Abū Sa'īd and consequently a cousin of Bābar, is mentioned in Gulbadan Begam's Memoirs, translation, p. 204. It is doubtful, however, if she can be the same as Saizida Āfāq. In a Persian MSS. in the Shaw Collection in the Indian Institute, Oxford, there is a reference to Bābar's friendship with Makhdūm Ā'aẓam, for it is stated there that Bābar, after his victory over Rānā Sangā, sent Darvesh Muḥammad Sārbān to the saint with presents, and a quatrain expressive of his respect for dervishes. Perhaps it was on this occasion that Bābar sent to Transoxiana the long religious poem called the Mubayyan, one-half of which has been published by Berezine at Kazan, and of which Sprenger saw a copy at Lucknow. Bābar wrote it in A.H. 928 (A.D. 1521), for the instruction of Humāyūn. At Rampur in Rohilkand there is in the Nawab's Library a small book of Turkī *verses* which, according to a note by S͟hah Jahān, are in Bābar's handwriting. It seems desirable that they should be edited and published. It is probably the Turkī-divān mentioned by Ḥaidar Mīrzā and Abul Faẓl.

SOME MSS. OF THE BĀBARNĀMA.

There is a good manuscript of 'Abdu-r-raḥīm's translation of the Memoirs in the Pott collection in the Eton College Library. It is No. 175, p. 22, of Professor Margoliouth's Catalogue of the Pott MSS., but is wrongly entered there as a History of Farg͟hāna. The MS. was written in Agra and bears the date of 7 Jamāda-al-awwal, 1051, (4th August, 1641). The MS. formerly belonged to Mr. Richard Johnson, and was bought in Lucknow for ten rupees. In the Bibliotheca Lindesiana, now in the John Rylands' Library, Deansgate, Manchester, there is a thick octavo volume containing 'Abdu-r-raḥīm's translation of the Memoirs. It is a well-written copy (Nast'alīq), but has neither date nor colophon. Probably it belongs to the 17th century. At the end of the account of the translations of the year 908 there is a curious deviation from other manuscripts. Instead of ending abruptly, as in the Shirāzī Bombay Lithographs, p. 75, or in Erskine, p. 122, with the words "Should a man live a hundred, nay, a thousand years, yet at last he must die," it goes on to say that Bābar's friends came up and arranged that he should leave the place, and that his ladies (*K͟hātūnān-i-ḥaram*) should be taken care of. It looks as if Bābar or some copyist had attempted to round off the description. As is well known, some of the Turkī copies have a much longer narrative in this place. The Bibliotheca Lindesiana also possesses a small fragment of the Turkī Memoirs. There is no date or colophon, but the MS. looks older than 1780, the date assigned by Mr. Kearney, and it has at the end the words *dastk͟hat* Nūr Muḥammad *ablah* (? ignorant ?) *wa* Abul Faẓl. Possibly this means that the MS. was written or signed by the Nūr Muḥammad who was Abul Faẓl's sister's son. There are also one or two other words which I could not read, but which perhaps give a regnal year.

It is much to be wished that the history of Bābar by Zain K͟hawāfy entered in Sprenger's Catalogue of the Elliot MSS. J.A.S.B., Vol. XXIII, p. 241, referred to in a note at p. 123 of the *Asiatic Quarterly Review* for July 1900, could be found. It was described as a very old copy and as the property of a friend of Sayyad Jān of Cawnpore. Perhaps it still exists at Cawnpore.

16. CONTRIBUTIONS TO ORIENTAL HERPETOLOGY III.—*Notes on the Oriental Lizards in the Indian Museum, with a List of the Species recorded from British India and Ceylon. Part 2.—By* NELSON ANNANDALE, B.A. (*Oxon.*), D.Sc. (*Edin.*), *Deputy Superintendent of the Indian Museum.*

The present is a continuation of my former paper with the same title, and deals with the remaining families of Oriental Lizards, *viz.*, the Lacertidæ, Scincidæ and Dibamidæ. As before, I append a revised list of the species in the families dealt with which have been, or are here, recorded from British India and Ceylon, with their distribution within these limits. To the epithet 'Oriental' I have given a liberal interpretation, including under the category of Oriental Lizards all those forms which occur on the mainland of Asia or in the western section of the Malay Archipelago, but excluding those only known from New Guinea or Australia.

Dibamus is represented by two specimens, a male and a female, from the Nicobars. They do not call for any comment. As regards the Lacertidæ and Scincidæ, however, the series is a fine one, naturally richest in Indian and Burmese forms—we are rather poor in examples from Ceylon—but including a very considerable number of specimens from Palestine (collected and presented by the late Dr. J. Anderson, F.R.S.), from Persia [1] (mostly obtained by Dr. W. T. Blanford, F.R.S.) and from Eastern Turkestan [2] (with a few exceptions, from the late Dr. F. Stoliczka). There are a few specimens also from Malaya, one or two from Singkip Island off Sumatra and several from Borneo; the last obtained from the Sarawak Museum, while those from Malaya and Singkip were either collected by one of the Museum collectors under the auspices of the late Professor J. Wood-Mason or were donated by the late Dr. Stoliczka. Otherwise the exotic (*i.e.*, extra-Indian) part of the collection is of little importance; it consists of a considerable number of miscellaneous specimens from Australia and the two Americas and a few from Europe and Africa.

LACERTIDÆ.

TACHYDROMUS SEPTENTRIONALIS, Gthr.

T. haughtonianus, *Jerd.*, *P.A.S.B.*, 1870, p. 72; *Stol.*, *J.A.S.B.*, (2), 1872, p. 88.

T. tachydromoides (*part.*), *Blgr.*, *Cat. Liz.* iii., p. 5, and *Faun. Ind.*, *Rept.*, p. 169.

T. septentrionalis, *id.*, *P.Z.S.* 1899, p. 161.

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[1] See Blanford, *Eastern Persia*, Vol. ii., Reptiles.

[2] *Id.*, *Scientific Results of the Second Yarkand Mission*, Reptiles.

The synonomy of the Indian species of *Tachydromus*, like that of many other genera, has been rendered obscure by imperfect descriptions. At least three closely related forms must be recognized as occurring within or near the borders of British India. They are (1) *T. sexlineatus*, Gray, recorded from Assam, Burma, Siam, the Western Himalayas, the Siamese Malay States, S. China, Sumatra, Java, Borneo, etc.; (2) *T. septentrionalis*, Gthr., known from S.-W. China and here recorded from Assam, and (3) *T. tachydromoides* (Schleg.), formerly believed to occur in Assam but probably confined, so far as our knowledge goes, to China, Korea and Japan. A very distinct species, *T. smaragdinus*, Blgr., from the Loo Choo Islands is represented in the Museum by a specimen given by the late Dr. J. Anderson.

T. tachydromoides was apparently included in the Indian fauna by Boulenger because he regarded it as synonymous with *T. haughtonianus*, which was described later. He also regarded *T. septentrionalis*, Gthr., at the time when he wrote his volume in the "Fauna," as identical with Schlegel's species; but more recently he has pointed out that Günther's species is really distinct, though very closely allied to the other. An examination of Jerdon's type in the Indian Museum shows that it is merely a specimen of *T. septentrionalis*, and, therefore, as Boulenger's more recent views seem to be correct, the name *T. tachydromoides* must be crossed out from the list of the Indian Lizards and *T. septentrionalis* inserted in its place.

Apparently the only specimen of *T. haughtonianus* recorded was the type, which I have examined. It is distinguished from specimens of *T. tachydromoides* by the absence of granules between the supraoculars and superciliaries and of a shield between the supraocular and the loreal. From *T. sexlineatus* it differs in having five rows of dorsal scales and a distinctly more elongated head. There is only one femoral pore on each side, but no small scales separate the outer rows of lateral plates. The specimen has four pairs of chin shields developed quite symmetrically—a condition I find also in two young specimens of *T. sexlineatus*, out of twenty-seven, young and adults, of this species examined. The coloration and proportions (except as regards the head) are practically identical with those of *T. sexlineatus*.

LACERTA VIRIDIS (Laur.)

L. viridis *var.* major, *Blgr.*, *Cat. Liz.*, iii, p. **17**.

The Museum possesses three specimens from Mount Hermon (*J. Anderson*) of Boulenger's variety *major*. As there is in the British Museum a specimen of the variety (Gray's species) *strigata* from the same locality and collection, the two varieties must occur together. The only specimens of *strigata* in the Indian Museum come from Persia (*W. T. Blanford*) and are immature.

OPHIOPS SCHLEUTERI, Boett.

O. schleuteri, *Blgr.*, *Cat. Liz.*, iii, p. 77.

O. elegans (*part*), *Werner*, *Zool. Jahrbr. Syst.* xix, 1904, p. 334.

Among a large number of specimens of *Ophiops elegans* from Palestine and Asia Minor (*J. Anderson*) six individuals from Mount Hermon have the more numerous body scales and other peculiarities of *O. schleuteri*, Boett., answering very closely to the descriptions of this form, which was at one time believed to be peculiar to Cyprus. The differences between *O. elegans* and *O. schleuteri* are very small but seem to be constant; they can generally be perceived, by mere inspection, without actually counting the scales. Boulenger suggests that Boettiger's species may be only a variety, but it seems best to consider it for the present as a distinct species occurring side by side with *O. elegans*, which, however, has a very much wider range, extending from Turkey to North-West India.

The remaining Lacertids in the collection call for no special mention. Only two species, *Scapteira scripta*, Strauch, (of which we have two Indian examples) and *S. aporosceles*,[1] Alc. & Finn., both from Baluchistan, have been added to the Indian fauna since 1890.

SCINCIDÆ.

MABUIA RUGIFERA (Stol.)

M. rugifera, *Blgr.*, *Faun. Ind.*, *Rept.* p. 190.

A specimen from Perak (*Mus. colltr.*) has seven longitudinal whitish bands on the dorsal and lateral surfaces. The three innermost commence immediately behind the head, the next two on either side at the posterior margin of the orbit. At the posterior extremity of the body they become indistinct, disappearing on the tail. We have also a specimen, in which the colour has faded, from the Nicobars (*Stoliczka*).

MABUIA MULTIFASCIATA, (Kuhl)

M. multifasciata, *Blgr.*, *Faun. Ind.*, *Rept.*, p. 191; *S. Flower*, *P. Z. S.* 1899, p. 646.

The Museum possessess a large series of this common Indo-Malayan skink. The following table shows the number of specimens with tri- and quinquecarinate dorsal scales respectively from different localities Six specimens from Penang and two from Upper Burma have tricarinate dorsal scales :—

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[1] Alcock and Finn, *J.A.S.B.*, 1896 (2), p. 559.

	Total No.	With 3 Keels.	With 5 Keels.	Percentage with 3 Keels.
Assam	13	12	1	92·3
Lower Burma ...	26	24	2	92·3
Andamans ..	14	3	11	21·4
Nicobars .	5	5	0	100
Borneo ...	30	30	0	100

These figures show clearly, though the number of specimens examined is not very great, that while Assamese, Burmese and Bornean specimens agree with those from Malaya (*fide* S. Flower) in being mostly provided with tricarinate dorsal scales, there is a greater tendency among Andaman specimens for these scales to be quinquecarinate, as I have already suggested.[1]

MABUIA TYTLERI, Blgr.

M. tytleri, *Blgr., Faun. Ind., Rept.*, p. 191.

Of this Andaman Skink the Museum possesses seven adults and a young one. One of the adults was obtained in the Botanical Gardens near Calcutta by the late Dr. Anderson ; but probably it had been introduced with specimens of living plants. As Boulenger had only Theobald's and Stoliczka's imperfect descriptions to go upon, it may be well to give a new diagnosis of the species, which is very distinct from any other.

Lower eyelid scaly : a postnasal. Body stout, head large, triangular ; snout moderate, obtusely pointed ; cheeks swollen in the adult ; tail long and slender, more than twice the length of head and body when perfect. Nostril behind suture between rostral and first labial ; supranasals generally in contact behind rostral ; anterior loreal not, or but slightly, deeper than posterior, in contact with second, sometimes also with first, labial ; frontsnasal slightly broader than long ; præfrontals in contact mesially ; frontal generally as long as frontsparietals and interparietal together, in contact with second supraocular ; four supraoculars, second largest ; superciliaris inclined to break up irregularly. Ear-opening crescentic, vertical, smaller than a lateral scale, without, or with small and indistinct, anterior lobules. Dorsal scales tricarinate, nuchals and laterals feebly keeled ; 24 to 26 scales round centre of body, subequal. The hind limb reaches the axilla. Subdigital lamellæ smooth. *Coloration* : dorsal surface uniform greyish brown, spotted on both limbs with dark-brown and white ; ventral surface dirty-white or greenish, tail dull-green or dull yellow.

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[1] *J.A.S.B.* (2), 1904, Suppl., p. 19.

In the young there is a dark lateral stripe which gives the Lizard much the appearance of *Lygosoma maculatum*, with which, judging from specimens in the Indian Museum, it has sometimes been confused. Even a very superficial examination is of course sufficient to distinguish between the two forms. The dimension, at any rate in respect to length, appear to exceed those of *M. multifasciata;* but the tail is very brittle and none of our specimens seem to be quite perfect as regards this organ. The shape of its head is very different from that of this species.

M. tytleri appears to be much scarcer than *M. multifasciata* in the Andamans.

MABUIA MONTICOLA, (Theob.)

Euprepes monticola, Gthr., apud *Theobald* (nec. *Günther*) *Rept. Brit. Ind.*, p. 52.

The specimens described as *Euprepes monticola*, Gthr., by Theobald in his *Reptiles of British India* are quite distinct from that form, which is (as Boulenger states) a synonym of *Mabuia dissimilis* (Hallow). The following description is based upon Theobald's examples, three in number, and a young specimen from Arakan (*Mus. colltr.*).

Lower eyelid scaly: a postnasal. Habit slender; head very small; snout short, obtusely pointed; tail slender, about $1\frac{1}{3}$ times the length of head and body. Hind limb reaches the elbow of adpressed fore-limb. Supranasals meet behind rostral, frontonasal broader than long; præfrontals in contact behind frontonasal; four large supraoculars followed by one small one, second largest, in contact with frontal; parietals entirely separated by interparietals, with straight posterior termination; one pair of nuchals. Ear-opening subcircular, smaller than a lateral scale, with several feeble anterior lobules. Dorsal scales bi-, tri- or quinquecarinate, generally with only two keels distinct 34 to 36 scales round centre of body. The colour has completely faded in the specimens.

Theobald's specimens have no history; possibly they come from the Eastern Himalayas or the hills of Assam.

MABUIA ANAKULAR, nom. nov.

Euprepes longicaudatus, *Anderson* (nec *Hallow*), *J.A.S.B.* (2) XL, 1871, p. 13.

The specimen described by Anderson as *Euprepes longicaudatus* represents a very peculiar form, resembling in its elongated and cylindrical shape some members of the genus *Lygosoma* but technically belonging to the genus *Mabuia*. As Anderson's name was preoccupied by Hollow, I have rechristened the species. The following description is based upon Anderson's specimen:—

Habit snake-like; limbs well developed, pentadactyle, hind limb reaching elbow of adpressed fore-limb; distance between tip of snout and fore-limb contained $1\frac{1}{3}$ times in distance between axilla and groin. Head very small; snout short, obtusely pointed, convex above. Lower eyelid scaly; a postnasal. Supranasals separated by frontonasal. Præfrontals form a median suture; frontal shorter than frontoparietals and interparietal together; parietals meet behind interparietal, one pair of enlarged nuchals. Ear-opening a little smaller than eye-opening, longitudinal, without lobules. Thirty scales round centre of body; dorsals, laterals and nuchals with 4 to 6 keels, only two of which are at all strongly marked. Length from snout to vent 35 mm.; tail (now much broken) at least three times as long as, stout in comparison with, body.

One specimen from Cachar (*Mus. colltr.*).

Anderson was right in regarding this species as allied to Theobald's *Euprepes monticola*, from which, however, it is quite distinct.

LYGOSOMA MACULATUM, (Blyth)

L. maculatum, *Blgr.*, *Faun. Ind.*, *Rept.*, p. 196.

Comparison with other specimens (of which we have a very large series), shows that those from Narcondam (see Annandale, *J.A.S.B.*, (2) 1904, *Suppl.*, p. 13) belong to this species. Boulenger says (*loc. cit.* and similarly in the *Catalogue of Lizards* iii, p. 242), "distance between end of snout and fore-limb equals $1\frac{1}{3}$ to $1\frac{1}{2}$ times distance between axilla and groin." This is obviously a *lapsus calami*, for the latter distance is the greater.

LYGOSOMA MITANENSE, sp. nov.

Diagnosis—

Allied to *Lygosoma indicum*, with which it agrees in lepidosis, except that it has 42 smooth scales round the centre of the body, the dorsals being considerably larger than the laterals or the ventrals. The hind limb reaches a point midway between the shoulder and the ear. Length from tip of snout to fore-limb is contained about $1\frac{1}{4}$ times between axilla and groin. The tail, which is laterally compressed, is more than twice the length of the head and body. The type is much discoloured but appears to have been marked in much the same way as *L. maculatum*.

Dimensions of type—

Total Length	...	130 mm.
Head ...	...	10 ,,
Body ...	...	34 ,,
Tail ...	...	91 ,,
Fore-limb ...	...	16 ,,
Hind Limb	...	25 ,,
Breadth of Head	...	6·5 ,,

A single specimen from Meetan, Lower Burma (*Tenasserim Expt.*).

Lygosoma dussumierii var. concolor, var. nov.

We have a specimen from Canara (*Col. Beddome*) which perhaps differs sufficiently from others to be given a varietal name, though the differences may be due to age. The rostral is convex; the dorsal and lateral surfaces are of an almost uniform pale bronze marbled on the sides of the neck with white, a colour which appears in the same manner on the labials and the sides of the tail; the size is greater than that of any other specimen I have seen (snout to vent 57 mm; tail 105 mm.).

Lygosoma olivaceum var. griseum, (Gray).

The only specimen of this variety in the Museum is one from Sinkip Island (*J. Wood-Mason*). Mr. Boulenger has kindly examined it. Specimens from the Andamans and Nicobars belong to the typical variety.

Lygosoma cacharense, sp. nov.

Diagnosis.

Subgenus *Keneuxia*, Gray.

Habit lacertiform; limbs well developed, pentadactyle; hind limb reaches wrist of adpressed fore-limb. Distance between tip of snout and fore-limb contained 1½ times in distance from axilla to groin. Snout short, obtuse, convex above; lower eyelid scaly; no supra- or postnasals. Præfrontals meet behind rostral; frontal as long as frontoparietals and interparietal together; frontoparietals meet behind parietal; so enlarged nuchals. Fifth and sixth upper labials beneath eye, enlarged. Ear-opening almost as large as eye-opening, oval, vertical. Twenty-four smooth, subequal scales round centre of body, nonimbricate laterally; præanals slightly enlarged. Tail less than twice the length of head and body. *Coloration*—dark-brown above, with darker lateral line; paler below:—

Total Length	118 mm.
Head	10 ,,
Body	35 ,,
Tail	73 ,,
Fore-limb	12 ,,
Hind Limb	23 ,,
Breadth of Head	7 ,,

One specimen from Nemotha, Cachar (*J. Wood-Mason*).

Lygosoma pulchellum (Gray)

L. pulchellum, *Blgr.*, *Cat. Liz.* iii., p. 254, pl. xvii, fig. 1.

I have been somewhat surprised to find an example from Tavoy (*Mus. colltr.*) of this extremely beautiful and distinct little Skink, which was described from the Philippines. It agrees closely both as regards lepidosis and proportions (actual and relative) and as regards coloration with Boulenger's description and figures. Major Alcock has kindly examined some of its most characteristic features with me.

LYGOSOMA SIKKIMENSE (Blyth)

There is a specimen from Simla in the Indian Museum, wrongly identified as *L. doriæ*. I am not aware that the species has been recorded hitherto from the Western Himalayas.

LYGOSOMA TRAGBULENSE, Alc.

L. himalayanum *var.* tragbulense, Alcock, *Report N. H. Pamir Bound. Comm.*, p. 36, pl. II, figs. 1, 1*a*.

Out of eleven specimens of *Lygosoma* collected on the Tragbal pass by Dr. G. M. Giles four belong to Alcock's variety *tragbulense*, while the remainder represent the typical *L. himalayanum*. Some of the latter are very much smaller than those of *tragbulense*, which, as well as the types, are fairly well grown. The coloration, therefore, cannot be due to youth; and though variety in coloration in itself is not a safe specific difference in the Skinks, it may be taken, when it is very distinctive, as an additional reason for separation if combined with differences in scaling. The greater number of subdigital lamellæ on the fourth toe which Alcock noted in his specimens, is constant, as are also the characteristic dorsal and lateral stripes, while the ventral scales have not the obscure dark edging common in *L. himalayanum* but are of an opaque white. There may be two scales under the eye; but this character is not constant.

LYGOSOMA BEDDOMII, Blgr.

The only specimen in our collection which can be assigned to this species differs from the descriptions in that the limbs do not meet when adpressed. Otherwise it conforms to Boulenger's diagnosis.

LYGOSOMA FORMOSUM (Blyth)

Mocoa formosa, *Blyth*, *J.A.S.B.*, (2) xxii, p. 651; *Blgr.*, *Faun. Ind.*, *Rept.*, p. 205.

The following description is based on the three types of Blyth's imperfectly described species:—

Subgenus *Emoa*, Gray.

Habit stout; head moderate; snout obtusely pointed; limbs well developed, overlap slightly; head and body about ⅘ length of tail. Lower eyelid with an undivided transparent disk, no supra or postnasals. Nostril behind suture between rostral and first labial; rostral forms a straight or nearly straight sulture with frontonasal; præfrontals in contact; frontal in contact with

1st and 2nd supraculars; 4 supraoculars, 2nd longest; 6 to 8 superciliaries, subequal; frontsparietals distinct; no enlarged nuchals. Dorsal scales smooth, larger than ventrals or laterals; 30 to 34 scales round centre of body. *Coloration*—Dorsal surface olive-green or pale-brown, spotted with dark-brown and white; a dark lateral band, also spotted with white; ventral surface and tail pale-brown or olive-green.

From Mirzapore (North-West Provinces) and Wazirabad, Punjab.

Lygosoma atrocostatum (Gray)

L. atrocostatum, *Blgr., Cat. Liz.* iii., p. 295; *S. Flower, P.Z.S.* 1899, p. 649.
L. jerdonianum, *Blgr. t. c.*, p. 300.
L. singaporense, *id.*, *t.c.*, p. 297.

In addition to Stoliczka's type of *Mabouya jerdoniana* from Pulau Tikus (Rat Island) off Penang, we have a specimen from Sinkip Island (*J. Wood-Mason*) which resembles it closely on the whole but has only 34 scales round the centre of the body, and six specimens from Borneo (*Sarawak Mus.*). These Bornean and Sinkip specimens have a single frontoparietal, while this scale is only partially divided in Stoliczka's. One of the Bornean specimens has supraoculars. I agree with Flower in regarding *L. jerdonianum* as a synonym of *L. atrocostatum*, to the synonomy of which I would also add *L. singaporense*, though I have not seen a specimen of the last.

L. atrocostatum does not appear to have been recorded from Sumatra, where it probably occurs, being found on Sinkip.

Lygosoma chinense (Gray)

L. chinense, *Blgr., Cat. Liz.* III, p. 318.

A specimen from Hong Kong (*J. Wood-Mason*) must, I think, be referred to this species. It has 4 supraoculars, and the coloration is as follows:—dorsal surface pale brown; lateral surfaces and tail mottled with dark brown and white; a dark lateral line starting from below the eye and becoming indistinct behind the fore-limb: ventral surface yellowish.

Lygosoma lineolatum (Stol.)

A specimen from Martaban is probably one of the types, but is entered in the Museum register simply as purchased, which is the case with other types of Stoliczka's.

Lygosoma comottii, Blgr.

A specimen from Tavoy (*Mus. colltr.*) agrees with Boulenger's description except that the fifth, not the sixth, upper labial is under the centre of the eye. The species does not appear to have been recorded from Lower Burma.

LYGOSOMA ANGUINUM (Theob.)

In addition to the types we have another specimen from Pegu and one from Amherst in Northern Tenasserim.

EUMECES SCUTATUS (Theob.)

E. tæniolatus, *Blanf.* Res , *2nd Yark. Miss.* Rept. p. 19.
E. scutatus, *Blgr. Faun. Ind. Rept.*, p. 218.

The Museum has specimens from Sind (*Karachi Mus.*); Rajputana (*N. Bellety*); N. Kashmir (*2nd. Yarkand Miss.*); Chitral (*F. J. Daly*), and Afghanistan (*Dr. R. M. Green*). The species has frequently been confused with *E. tæniolatus.*

EUMECES TÆNIOLATUS (Blyth)

E. tæniolatus, *Blgr, Faun, Ind., Rept.*, p. 219.

Of this species we have only two true specimens, both from the Punjab Salt Range (*Theobald*). One has two, the other only one postmental; otherwise they agree closely, differing considerably from the preceding form.

SCINCUS MITRANUS, Anders.

S. mitranus, *Blgr., Cat. Liz.* iii,p. 393.
S. arenarius, *id., t.c* p. 392; & *Faun. Ind., Rept.*, p. 221.

In his description of *S. mitranus* Anderson states that it has five supraoculars. The type, however, (the locality of which is doubtful) has six on one side of the head; while on the other traumatic injuries to the skin forbid an opinion. Specimens of Murray's *S. arenarius* from Sind agree in every other respect with this individual, which is, on the whole, well preserved.

CHALCIDES OCELLATUS (Forsk.)

There are a number of specimens (*purchased*) in the Museum said to come from Haldibari (Kooch-Behar): their true *provenance* is doubtful but probably Indian. They belong to var. A of Boulenger's *Catalogue* (iii, p. 401), as also do Persian examples (*Blanford*), but are rather darker than examples from Palestine and Egypt.

LIZARDS OF INDIA, BURMA AND CEYLON (II).

LACERTIDÆ.

156.	Tachydromus sexlineatus, Daud.	E. Himalayas; Assam; Burma.
157.	,, septentrionalis,* Gthr.	Assam (= *T. tachydromoides* Schleg. (*partim*) in Blgr., *Faun. Ind., Rept.*, p. 169).
158.	Acanthodactylus cantoris, Gthr.	N.-W. India.
159.	,, micropholis,§ Blanf.	Baluchistan; Sind.
160.	Cabrita leschenaultii (M.-Edw.)	S. India as far north as S. E. [Berar.
161.	,, jerdonii, Bedd.	Godavari Valley; Elloré.
162.	Ophiops jerdonii, Blyth.	Central and N.-W. India.
163.	,, beddomi (Jerd.)	S. India; Bombay Presidency.
164.	,, elegans, Ménétr.	Punjab.
165.	,, microlepis,§ Blanf.	N. India from Katch to W. Bengal.
166.	Eremias guttulata (Licht.)	Sind; Baluchistan.
167.	,, brevirostris§ (Blanf.)	Punjab.
168.	,, velox (Pall.)	Baluchistan.
169.	,, fasciata,§ Blanf.	Baluchistan.
170.	Scapteira scripta,* Strauch	N. Baluchistan (*Antea*).
171.	*Scapteira acutirostris*, Blgr.	N. Baluchistan.
172.	Scapteira aporosceles,*§ Alc. & Finn	N. Baluchistan (Alcock & Finn, *J.A.S.B.* (2) 1896).

SCINCIDÆ.

173.	Mabuia bibronii (Gray.)	S. India; Ceylon.
174.	*Mabuia doriæ*, Blgr.	Upper Burma.
175.	Mabuia dissimilis (Hallow)	N. India from Sind to Bengal.
176.	,, septemtæniata (Reuss)	Sind.
177.	,, novemcarinata§ (Anders.)	Mandalay.
178.	,, beddomii (Jerd.)	S. India, north to S.-E. Berar.
179.	,, vertebralis, Blgr.	Central India.
180.	,, rugifera§ (Stol.)	Nicobars.
181.	,, multifasciata (Kuhl)	Assam; Burma; Andamans and [Nicobars.
182.	,, tytleri, Blgr.	Andamans; Calcutta (introduced ?).
183.	*Mabuia quadricarinata*, Blgr.	Kakhyen Hills. Upper Burma.
184.	Mabuia monticola *§ (Theob.)	Arakan; ? E. Himalayas (*Antea*).
185.	,, anakular,*§ Annand.	Cachar (= *Euprepes longicaudatus* Anders. *Antea*).
186.	Lygosoma indicum (Gray)	E. Himalayas; Hills of Assam and Burma.
187.	,, mitanense,*§ Annand.	Lower Burma, (*Antea*).
188.	,, maculatum (Blyth.)	N. Bengal; E. Himalayas; Assam Burma.
189.	,, dussumieri, D. & B.	Malabar province.
190.	,, olivaceum (Gray)	Tenasserim; Andamans; Nicobars.
191.	,, cacharense,*§ Annand.	Cachar (*Antea*).
192.	*Lygosoma subcæruleum*,* Blgr.	Travancore (Blgr; *Ann. Mag. N. H.* 1891, p. 289).
193.	,, pulchellum * (Gray)	Tavoy (*Antea*).
194.	*Lygosoma kakhienense*, Blgr.	Kakhyen Hills, Upper Burma.
195.	Lygosoma melanostictum, Blgr.	Tenasserim; Tavoy.
196.	,, sikkimense (Blyth)	W. Bengal (Pareshnata Hills); E. Himalayas; Simla.
197.	,, himalayanum (Gthr.)	W. Himalayas; Kashmir; Central Provinces.
198.	,, tragbulense,*§ Alc.	Tragbal Pass, Kashmir (Alc., *Pamir Bound. Comm. N. H.*, p. 36).
199.	*Lygosoma doriæ*, Blgr.	Upper Burma.

200.	Lygosoma ladacense (Gthr.)	Ladak.
201.	*Lygosoma laterimaculatum*, Blgr.	S. India.
202.	Lygosoma bilineatum[1] (Gray.)	„
203.	Lygosoma beddomii, Blgr.	S. India.
204.	„ macrotympanum § (Stol.)	S. Andamans.
205.	*Lygosoma macrotis* (Steind.)	Nicobars.
206.	Lygosoma formosum*§ (Blyth)	N.-W. Provinces; Punjab (*Antea*.)
207.	„ taprobanense, (Kel.)	Ceylon.
208.	„ fallax, Ptrs.	„
209.	„ lineolatum § (Stol.)	Martaban, Lower Burma.
210.	„ comotti, Blgr.	Upper Burma; Tavoy.
211.	„ albopunctatum (Gray)	S. & E. India; Assam; Burma.
212.	„ punctatum (Linn.)	Peninsular India; Ceylon.
213.	„ guentheri (Ptrs.)	S. India; C. India; Bombay.
214.	„ cyanellum [2]§ (Stol.)	Burma.
215.	„ aguinum § (Theob.)	Pegu; N. Tenasserim.
216.	*Lygosoma calamus*, Blgr.	Upper Burma.
217.	Lygosoma lineatum (Gray)	Central Provinces.
218.	*Lygosoma punctatolineatum*,* Blgr.	Bia-po, Burma (Blgr., *Ann. Mus. Genova*, 1893, p. 321.)
219.	Ablepharus brandtii, Strauch	Punjab; Sind; Baluchistan.
220.	„ grayanus,§ (Stol.)	Katch and Sind.
221.	Ristella rurkii, Gray.	Anamalay Hills, S. India.
222.	„ travancorica, Bedd.	Travancore (hills).
223.	*Ristella guentheri*, Blgr.	Madura (hills).
224.	Ristella bedomii, Blgr.	S.-W. India (hills).
225.	Tropidophorus berdmorii, (Blyth)	Lower Burma.
226.	*Tropidophorus yunnanensis*, Blgr.	Kakhyen hills, Upper Burma.
227.	Eumeces scutatus (Theob.)	Sind; Katch; Punjab; Kashmir; Chitral.
228.	„ tæniolatus§ (Blyth)	Punjab Salt Range.
229.	„ schneideri (Daud)	Baluchistan.
230.	„ blythianus§ (Anders.)	? Punjab; Afridi District.
231.	Scincus mitranus,*§ Anders.	Sind (-*S. arenarius*, Murray. *Antea*.)
232.	Ophiomorus tridactylus (Blyth)	Punjab; Sind; Baluchistan.
233.	*Ophiomorus blandfordii*, Blgr.	Baluchistan.
234.	Chalcides ocellatus (Forsk)	Sind.
235.	*Chalcides pentadactylus* (Bedd).	Beypore, Malabar.
236.	*Sepophis punctatus*, Bedd.	Golgonda and Godavari Hills.
237.	*Chalcideseps thwaitesii* (Gthr.)	Ceylon.
238.	Acontias burtonii (Gray)	„
239.	„ monodactylus (Gray)	„
240.	„ layardii, Kelaart	„
241.	*Acontias sarasinorum*, F. Müller	„

DIBAMIDÆ.

242.	Dibamus novæ-guineæ, D. & B.	Nicobars.

In the above list, as in that of the preceding families, a * opposite a name indicates that the species is new to the Indian fauna since 1890; a § that the Indian Museum possesses a type or cotype. Names in italics are those of species not represented in the collection.

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[1] Y. Rama Chandran, M.A., student, Madras, has lately sent me a specimen of *L. bilineatum* which has, as he points out, 26 scales round the body. June 22nd, 1905.

[2] Including *L. fex*. See Boulenger, *Ann. Mus. Gen.* (ii) xiii, p. 320.

In Boulenger's volume in the "Fauna of India" (1890), 221 species of Lizards are described; at present 242 appear to occur within the Indian Empire and Ceylon, but the grounds on which three of these are included are a little insecure. The majority of the species added have been new to science, but a few previously known from other parts of Asia have been recorded from Baluchistan. Several new forms have been described from the same neighbourhood several from Burma (chiefly from Lower Burma), one from S. India, two from the Andamans and one from Cachar. Undoubtedly novelties still remain to be discovered, especially in the extreme east of the Empire; and probably certain forms now regarded as solely Malayan will be found also in Tenasserim. Several forms, e.g. *Lygosoma zebratum* and *L. feæ* have been shown to be at most varieties of previously described species.

Mr. Grey Pilgrim, of the Geological Survey of India, has lately collected in Eastern Arabia and presented to the Museum the following specimens:

Uromastix microlepis, (Blanf.) ...	One specimen.
Varanus griseus (Daud.) ...	,,
Eremias brevirostris (Blanf.) ...	Two specimens.

I neglected to mention in the former part of this paper, that *Gymnodactylus khasiensis* has lately been recorded from Upper Burma by Boulenger, *Journ. Bombay N.H. Soc.*, xiii, p. 553.

July 26*th*, 1905.

Note.—Through the kindness of Dr. A. Willey, F.R.S., Director of the Colombo Museum, I have lately had an opportunity of examining the types of Nevill's *Euprepes halianus*, a Ceylonese Skink regarding the systematic position of which Boulenger expresses a doubt. As they possess retractile claws, while otherwise agreeing with *Lygosoma*, I propose to place them in a new genus *Theconyx*, which will be fully described later in *Spolia Zeylanica*, the organ of the Colombo Museum. August 23rd, 1905.

17. *Tibet, a dependency of Mongolia.*—(1643—1716 A.D.).—*By Rai* SARAT CHANDRA DAS, *Bahadur*, C.I.E.

The six Khanates of Mongolia had, for a long time, remained under a solemn compact which kept them in peace. At last, the Khan of Chakar, named Legdan, who had grown ambitious, made a breach into it, in consequence of which internal dissensions broke out among them. Friendly advisors and intermediators came from the neighbouring States to bring upon reconciliation among the contending parties in Khalkha, the country of the Kulmuc Mongols. One of the claimants to inheritance in that Khanate being driven out of the country, came with his hordes to the bank of Lake T'hig-Çôg Gyalmo and took possession of the province of Hoço-tshe of Thumed-Mongolia. His descendant who had settled there was attached to the *shwamar* or Red-cap School of Tibet. About this time the two rival sects of Buddhism, namely, the Red-cap and the Yellow-cap Lamas, were fighting with each other in Tibet. Rab-chyampa, a representative of the Red-cap sect proceeded to Mongolia and appealed for help to the Khan of Hoço-tshe. In the year *Tree-hog* the Khan sent his son Arsaling (Abaling) at the head of 10,000 Tartars to Tibet to extirpate the Yellow-cap Church. The prince being humane and pious refrained from doing injury to the Yellow-cap Lamas, so the Red-cap Lamas, out of spite, sent misrepresentations against him to his father, accusing him of partiality to their enemies. The Khan, who was at that time engaged in war in the Kokoner country, became furious at his son's conduct and wrote to the Rab-chyampa to take the prince's life. On Arsaling's death, which was probably caused either by poison or assasination, the Tartar troops were thrown into disorder. For the want of a leader they dispersed like a cloud and returned to their country. About this time the Khan of Duthukthu, a descendant of Jenghis Khan, who had also espoused the cause of the Red-cap Lamas, started from Chakar with a large army to help them in their struggle with the Yellow-Church. But on his arrival at Kokonor he accidentally died. A great enemy of Buddhism now arose in Kham, who followed the Bon religion. This was the King of Beri, named Don-yo dorje. He, like King Langdarma, had destroyed all the Buddhist Institutions of Kham belonging to the Red-cap and the Yellow-cap sects. He was about to start with a large army for conquering Tibet proper when the Khan of Œleuth Mongols entered Kham with his Tartar hordes. This was Gushi Khan the third of the five sons of the Khan of Hoçod, one of the four divisions of Orad Mongolia. Like Jenghis Khan, he too was believed to have been an incarnation of the Lord of Death. His native name was Toral Beẖu, but he is better known by the names Gushi Khan or Gegan Khan. Owing to his devotion to the cause of the

Yellow-cap Church he is known in Tibet by the Tibetan name of Tenzing Choigyal, the upholder of religion or Dharma Rājā. While only thirteen years of age he was entrusted by his father with the leadership of the Tartar hordes. He defeated the Gokar[1] Tartars and brought them under subjection in 1593. At the age of 25 he was successful in reconciling the Kulmucs of Khalkha with the Œleuth Mongols who were quarrelling on account of a question of precedence between the hierarch of Gahdan and Ston s̱kor Sabs̱-drung named Jetsundampa, and thereby averted a fierce and bloody war in the heart of Mongolia. For this service, he was decorated with the holy order of Tā Kausri by the Emperor of China in 1605, from which circumstance his name Kushri or Gushi Khan had originated. At the age of 35, at the earnest entreaties of *Desrid* Sonam Choiphel, Paṇchen Rinpoche of Tashilhampo and other representatives of the Yellow-Church, he agreed to march into Tibet to punish their enemies. In the year *Fire-ox* in the first month, *i.e.*, February, he entered Kokonor with a large army. He despatched about 10,000 troops to Çhog-thu in Khalkha to suppress a rebellion there. His hordes routed 40,000 Tartars in a single battle fought at Utan Hoço in one day, and killed the Khan. From Kokonor, Gushri Khan moved towards Tibet. He reached the great monastery of Gahdan in the auspicious evening of the 27th day of the month, when he saw a halo of light brightening the horizon at dusk.

During the winter of that year he again visited Kokonor, and from there proceeding to Kham, on the 25th of the 11th month, he annexed the whole of King Beri's dominions to his kingdom. Seeing that Beri would be dangerous to both the Church and the State he put him to death and released the Lamas of the several Buddhist sects who had been thrown into prison by that apostate king of Kham. Gushri then brought under his control all the territories bordering on Jangsathul—the dominions of the king of Jangsa. Then entering Tibet proper with his invincible hordes, he made presents to the great monasteries of the Yellow-Church and proclaimed his authority over the whole country. From Lhasa he marched to Tsang with the major portion of his army. In the year called *water-horse*, on the 8th of the first month, he captured thirteen large *jongs* (forts), including that of Samdub-tse at Shigatse, and overthrew the power of the king of Tsang. On the 25th of the 11th month he threw him into prison. At first, out of respect for the valour of the fallen monarch, he did not order him to be beheaded, but at the representation of the leaders of the Yellow-Church he was found guilty of the highest crime, having had established a rival monastery of the Red-cap Church, called Tashizil, in the immediate vicinity of Tashilhunpo, with the object of ruining the latter. Gushri Khan caused him to be packed in a hide[1] and then threw him into the river. He then commenced the pious work of establishing a University with thirteen colleges, which were called Ling or divisions, at Lhasa, for the education of both the laity and the clergy. Of these thirteen Lings only four have survived, namely, Tan-gyeling, Tshe-chog-Ling, Kûndû-Ling and Tshemo-Ling. He brought all the great *Cholka* or Provinces of Tibet under his power. Hearing that the Lamas of Kongpo, were greatly attached to the Red-cap Karmapa Sect, he sent a division of his army there and annexed the eastern provinces to his dominions. He now declared himself the supreme ruler of all Tibet and Mongolia, and sat on the Lion-throne of Potala at Lhasa. On this auspicious occasion he received presents from the border states of India, such as—Bushing (probably Bushahir), Yambu (Nepal), Ngah-ri (Ladak), etc. The Tibetans of the older sects began to regard him as an incarnation of their saint Padma Sambhava. After making the Yellow-Church dominant all over Tibet and Mongolia he shewed tolerance to the followers of the rival sects and patronized learning. Thus Mongolia and Tibet being brought together under the sovereignity of one Royal Umbrella, the religion of Buddha, as reformed by Tsongkhapa, flourished and shone with greater lustre than it had done even during the reformer's time. Under the benign rule of this devout king all classes of people enjoyed peace and prosperity, as if they were living in the ideal age of perfection.

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[1] The Western Mongolians who had become Mahomedans were called Gokar on account of their using the white *Pagri*, from *go* head and *kar* white.

After Gushri Khan's death his son Dayan Khan reigned for fourteen years over Tibet. On his death his son Talai Khan, also called Ratna Gyalpo, succeeded to the throne. Ratna's eldest son named Tanzin Wangyal succeeded him, but he did not reign long, being mysteriously poisoned. During the reigns of these kings the office of the *Desrid* was successively filled by Pon Sonam Choiphel for seventeen years, from the year *Iron-serpent ;* by T'hin las Gyatsho for ten years ; by Lozang thutob for six years ; and by Lozang Jinpa for three years. Then it passed to the layman Sangye Gyatsho who held it for nearly twenty-five years from the year *Earth-sheep*, during which time he completed the building of the nine-storeyed palace on Potala called the Phodang Marpo. In the year *Fire-tiger* there was war between the Khalkha and the Œleuth Mongols. The hierarch of Gahdan, named T'hi-Lodoi Gyatsho, reconciled the belligerents to each other and induced them to make a treaty of peace. On the death of Tanzing Wañgyal, Lhabzang, the younger son of Ratna who was exiled, succeeded to the throne. His first act was to wreak vengeance[2] on the *Desrid*, Sangye Gyatsho, who had been instrumental in bringing about his banishment. During his exile Lhabzang had collected about 500 Tartar troops. Entering Tibet with them he collected a large army from the 13 *Thikor* of Tibet, besides Kongpo and other provinces and took possession of the throne. In the year *Tree-bird* he killed *Desrid* Sangye Gyatsho. He reigned for nearly thirteen years.

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[1] This punishment is called *Ko-thûmgyab-pa*, i.e., packing the criminal in hide or skin and then throwing him in the deep water of a river. This is the capital punishment that is inflicted on the higher class of criminals in Tibet.

[2] At this period it was suspected that the Lama authorities of the Yellow-cap Church were intriguing to kill the king (Lhabzañg) by exorcism.

Hearing the news of *Desrid's* violent death, the Khan of Chungar (Żungaria), the left branch of the Œleuth Mongols named Hûng Thaijé, who was devoted to the Yellow-cap Church, sent presents to the Dalai Lama, and with a view to restore peace and prosperity in the troubled land of the Lamas, sent his generals to invade Tibet with a large army. In the year *Fire-bird* they captured Lhasa, defeating Lhabzang in a battle in which he fell. Thus in 1716 ended the short-lived kingdom founded by Gushri Khan in Tibet. In the year 1717 the Chungar army, after sacking the *Ñingma* monasteries of Namgyaling, Dorje Tag, Mindolling, etc., and making the Yellow-cap Church still more predominant all over Tibet, returned to Mongolia.

18. *Sarvajña-mitra—a Tāntrika Buddhist author of Kāśmīra in the 8th century A.D.—By* PROF. SATIS CHANDRA VIDYABHUSANA, M.A.

Among the manuscripts presented to the Asiatic Society of Bengal by Mr. Hodgson, there is a Buddhist Sanskrit work named Sragdharā-stotra by Sarvajña-mitra. The work derives its name from that of the metre, *viz.*, *Sragdharā*,[1] in which it is written. It is a hymn consisting of 37 stanzas in praise of the Tāntrika goddess Tārā who is called in Tibetan Sgrol-ma. There is a Sanskrit commentary on the work, called Sragdharā stotra-ṭīkā, by Jinarakṣita who was a monk of the great monastery of Vikramaśilā and a spiritual guide of a king of the time.

The commentator states that Sarvajña-mitra, the author of Sragdharā-stotra, was a devout monk of Kāśmīra and was renowned for his unbounded charity. Having given away everything he possessed, he left the country and wandered abroad as a mendicant. Once while he was proceeding to the kingdom of Vajramukuṭa, he met on the way a poor old Brāhmaṇa who was in a very pressing need of money for the marriage of his daughter. The Brāhmaṇa, who was going to the place of Sarvajña-mitra himself for help, having learnt that the latter had nothing left except the beggar's bowl and robe, fell into great despair and shed tears. Sarvajña-mitra, however, consoled him saying: "Be not sad, I shall give you what you ask for." At that time King Vájramukuṭa was told by a certain person that all his desires would be fulfilled if he could wash himself sitting on 100 skulls freshly severed from the trunks. The king who had already secured 99 persons completed the number 100 by purchasing Sarvajña-mitra, who sold his person for its weight in gold which was given to the poor Brāhmaṇa. The 100 victims were in a morning led into the Executioner's Tank by officers of the king. Sarvajña-mitra finding no means of escape composed and chanted 37 stanzas in praise of Āryā Tārā, whereupon *all* the victims were miraculously saved and taken to their respective homes. Heaps of gold equal to the weight of the victims remained deposited on the edge of the tank. The king, surprised at the miraculous power of the monk, became a disciple of his.

The story of Sarvajña-mitra and a literal Tibetan translation of the Sragdharā-stotra are to be found in the Tangyur, section Ṛgyud, vol. L.

A similar story about Sarvajña-mitra is narrated in the Tibetan work called Pāgsam-jon-zang edited by Rai Sarat Chandra Das

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[1] The Sragdharā metre contains twenty-one syllables in each foot broken into three equal parts. In the Chandomañjarī, the Sragdharā verse is thus scanned :—

— — — — ⏑ — — ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ — — ⏑ — — ⏑ — —

Bahadur, C.I.E. According to this work Sarvajña-mitra, though born in Kāśmīra, was a student of the monastery at Nālanda in Magadha where he became a great master of sciences. The king to whom he sold his person is called Vajra-mukuṭa in the Sanskrit Sragdharāstotraṭīkā, while he is called Saraṇa in the Tibetan, Pāgsam-jon-zang. The story contained in the Pāgsam-jon-zang (p. 102) runs thus :—

" A little bastard child of the King of Kāśmīra was carried away by a vulture from the roof of the palace and dropped on the top of the Gandhola (the great central temple) of Nālanda in Magadha. The Pandits of the Vihāra, taking mercy on it, nursed it. As he grew up the child acquired great knowledge and became a scholar. He propitiated the goddess Āryā Tārā and thereby acquired great wealth. He gave away all his riches in charity, and when there was nothing left he started on a journey to Southern India. Meeting on the way an old blind Brāhmaṇa who was being led by his son, he inquired where he was going. Being told that the blind Brāhmaṇa who was very poor had started on his distant journey to beg help from Sarvajña-mitra of Nālanda, he was overpowered with pity and determined to sell his own body to give gold to the helpless beggar. At this time he learnt that King Saraṇa, who at the advice of his wicked spiritual guide had undertaken the performance of a *Yajña* in which 108 human sacrifices were necessary, was in search of one more victim which was wanting to complete the full number. The king was convinced that if he successfully performed the *Yajña* he would attain the longevity equal to the sum of the longevity of 108 souls that would be sacrificed in it. Sarvajña-mitra sold himself to the king and paid the gold that he had obtained therefrom to the blind Brāhmaṇa. While waiting one night for death in a dark dungeon he invoked the goddess Tārā with the utmost concentration of his mind. When fire blazed up from the piled firewood and all the 108 men were led in chains to the pyre, a heavy shower of rain fell which extinguished the fire within a short time and converted the whole plain where the sacrifice was being performed into a large sheet of water resembling a lake. The king and his ministers hearing that this was due to the mercy of the goddess Tārā who was invoked by the victim who had sold himself to save others, now acquired faith in the religion of Buddha and having released all the 108 victims of the unholy sacrifice sent them to their respective homes loaded them with presents. Sarvajña-mitra before whom the goddess had miraculously appeared, held fast a corner of her celestial robe and was carried to the land of his birth."

The same story is related in Lama Tārānātha's history of Buddhism (*vide* A. Schiefner, p. 168 ff.).

Neither in the Sragdharā-stotra nor in its commentary is there any mention of the date of either of the two works. Dr. Rājendra Lāla Mitra who notices the two works in his Buddhist Literature of Nepal, p. 228, says nothing about their dates. The Rājataraṇgiṇī, the well-known chronicle of Kāśmīra, supplies us, however, with some data to determine the age of Sarvajña-mitra the author of Sragdharā-stotra. In Book IV, verse 210 of the Rājataraṅgiṇī, we find that Bhikṣu Sarvajña-mitra, who appeared as another Jina, resided in Kayyavihāra, which had been built by King Kayya. This Kayya is stated to have been a king of Lāṭa or Central and Southern Guzerat, and was subordinate to King Muktāpīḍa-Lalitāditya of Kāśmīra. As Lalitāditya is generally held to have lived early in the 8th Century A.D., Sarvajña-mitra who resided in Kayyavihāra could not have flourished before that time. As the monastery of Nālanda was destroyed in the 9th century A.D., Sarvajña-mitra, who was educated there, could not have lived after that time. This leads me to suppose that Sarvajña-mitra lived in the middle of the 8th century A.D.

King Vajramukuṭa or Saraṇa has not yet been identified. Vajramukuṭa is perhaps identical with Vajrāditya, son of Lalitāditya, King of Kāśmīra in the 8th Century A.D.

JUNE, 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 7th June, 1905, at 9-15 P.M.

The Rev. E. Francotte, S.J., in the chair.

The following members were present :—

Dr. N. Annandale, Babu Dwarkanath Chakravarti, Mr. L. L. Fermor, Mr. D. Hooper, Dr. W. C. Hossack, Mr. J. Macfarlane, Mr. H. H. Mann, Major D. C. Phillott, I.A., Mr. R. R. Simpson, Mr. H. E. Stapleton, Pandit Satis Chandra Vidyabhuṣaṇa, and Mr. E. Vredenburg.

Visitors :—The Rev. L. Delaunoit, S.J., Mr. J. M. Maclaren and Mr. E. Vieux.

The minutes of the last meeting were read and confirmed.

Twenty-five presentations were announced.

Pandit Nava Kanta Kavibhushan was ballotted for and elected an Ordinary Member of the Society.

It was announced that the Hon. Mr. Justice J. G. Woodroffe, Mr. C. R. Marriott, and Captain Stuart Godfrey, I.A., had expressed a wish to withdraw from the Society.

The General Secretary reported the death of Mr. H. W. Peal, an Ordinary Member of the Society.

The proposed revision in Rules 5 and 7 of the Society's Rules, of which intimation had already been given by circular to all members, was brought up for final disposal. The votes of the members were laid on the table and the Chairman requested any Resident Members who had not expressed their opinion, to take the present opportunity of filling in voting papers. Five such papers were filled in, and with the 106 returned by members, were scrutinized, the Chairman appointing Messrs. H. E. Stapleton and L. L. Fermor to be Scrutineers. The Scrutineers reported as follows :—

For	104
Against	7

RULE 5.

PRESENT RULE.	PROPOSED RULE.
Mode of Election of Ordinary Members. Candidates for Ordinary Membership shall be proposed by one, and seconded by another, Ordinary Member. The name of the candidate, his proposer and seconder, shall be laid before a Meeting of the Council, and shall be read at the two Ordinary General Meetings of the Society which next succeed such Meeting of the Council, and during the interval shall be suspended in the Society's Meeting-room. The candidate shall be ballotted for at the *second* of such Ordinary General Meetings.	**Mode of Election of Ordinary Members.** Candidates for Ordinary Membership shall be proposed by one, and seconded by another, Ordinary Member. The name of the candidate, his proposer and seconder, shall be laid before a Meeting of the Council, and if approved, shall be recommended for election by ballot at the next Ordinary General Meeting of the Society. The names of candidates recommended by the Council for election shall be communicated to the Resident Members of the Society, with the usual notice of the General Meeting, and in case any five Ordinary Members consider it desirable, they will be at liberty to demand that the candidates' certificates be suspended in the Society's Meeting-room until the next following General Meeting, when the candidate shall be ballotted for. Any such demand for a postponement of election made under this rule must be made in writing, signed by at least five Ordinary Members, and presented at the Ordinary General Meeting before the proposed election takes place.

RULE 7.

PRESENT RULE.	PROPOSED RULE.
Council empowered to elect Ordinary Members during the Recess. Should there be no meeting during the Recess months of September and October, the Council shall be empowered to elect candidates for ordinary	**Council empowered to elect Ordinary Members during the Recess.** Should there be no meeting during the Recess months of September and October, the Council shall be empowered to elect candidates for Ordinary

Membership, who shall have been duly proposed and seconded at the General Meeting of the Society in August, or whose names may be received as candidates during the Recess. Such candidates shall be ballotted for at the Meeting of the Council next succeeding that at which their names and those of their proposers and seconders shall have been laid before the Council, and during the interval between the two meetings these names shall be suspended in the Society's Meeting-room, as provided in Rule 5; and it shall be necessary for the due election of such candidates that not less than two-thirds of the Members of Council present at the meeting shall vote in their favour. Such elections shall be reported and confirmed at the first General Meeting of the Society after the Recess.

Membership whose names may be received as candidates during the Recess. Such candidates shall be ballotted for at the Meeting of the Council next succeeding that at which their names and those of their proposers and seconders shall have been laid before the Council; and during the interval between the two meetings these names shall be suspended in the Society's Meeting-room. It shall be necessary for the due election of such candidates that not less than two-thirds of the Members of Council present at the meeting shall vote in their favour. Such elections shall be reported and confirmed at the first General Meeting of the Society after the Recess.

The following papers were read :—

1. *An Analysis of the Laṅkāvatāra Sūtra.—By* PROF. SATIS CHANDRA VIDYĀBHŪṢAṆA, M.A.

2. *Note on a Rock Shrine in Lower Siam.—By* N. ANNANDALE, B.A., D.SC.

The paper will be published in the Memoirs.

3. *Religion and Customs of the Uraons or Oraons.—By* REV. FATHER DEHON, S.J. *Communicated by* MR. E. A. GAIT, I.C S.

The paper will be published in the Memoirs.

4. *Tibet under her Last Kings* (1434-1642 *A.D.*).—*By* RAI SARAT CHANDRA DAS, BAHADUR, C.I.E.

5. *Note on a Decomposition Product of a Peculiar Variety of Bundelkhand Gneiss.—By* C. A. SILBERRAD, B.A., B.SC., I.C.S.

LIBRARY.

The following new books have been added to the Library from July to August, 1905.

Annandale, Nelson. On Abnormal Ranid Larvæ from North-Eastern India. *London*, 1905. 8°.
Proceedings of the Zoological Society of London, 1905, Vol. I.
Presd. by the Author.

Bose, Chuni Lal, *Rai*. Combustion...An address, *etc.* *Calcutta*, 1905. 8°.
Presd. by the Calcutta University Institute.

CACHARI Primary Arithmetic. (Paiseb banta sygang.) Part I, *etc.* *Shillong*, 1905, *etc.* 8°.
Presd. by the Chief Commissioner of Assam.

Chapman, Sydney J. The Lancashire Cotton Industry. A study in economic development. *Manchester*, 1904. 8°.
Publications of the University of Manchester, Economic Series, No. 1.
Presd. by the University.

COLOMBO MUSEUM. Spolia Zeylanica. Vol. I, *etc.* *Colombo*, 1903, *etc.* 8°.

Davenport, C B. Statistical Methods with special reference to Biological variation...Second, revised edition. *New York*, 1904. 8°.

Dercle, C. De la pratique de notre médecine chez les Arabes. Vocabulaire arabe-français d'expressions médicales, *etc.* *Alger*, 1904. 8°.

Eitel, Ernest J. Feng-Shui: or, the rudiments of Natural Science in China. *London*, 1873. 8°.

Freer, Paul C. The preparation of Benzoyl-Acetyl Peroxide, and its use as an intestinal antiseptic in cholera and dysentery. *Manila*, 1904. 8°.
Bureau of Government Laboratories, Manila, No. 2.
Presd. by the Bureau.

Haeckel, Ernst. Der Kamp um den Entwickelungs-Gedanken. Drei Vorträge....Mit...Tafeln, *etc.* *Berlin*, 1905. 8°.
Presd. by the Author.

Hahn, *Rev.* Ferd. Kurukh Folklore in the original. Collected and transliterated by Revd. F. Hahn. *Calcutta*, 1905. 8°.

Presd. by the Government of Bengal.

Herzog, Maximilian. A Fatal infection by a hitherto undescribed chromogenic bacterium: Bacillus aureus fœtidus. *Manila*, 1904. 8°.
Bureau of Government Laboratories, Manila, No. 13.

——The Plague: Bacteriology, morbid anatomy, and histopathology, *etc.* *Manila*, 1904. 8°.
Bureau of Government Laboratories, Manila, No. 23.

Herzog, Maximilian, AND OTHERS. I. Does Latent or dormant plague exist where the disease is endemic. By M. Herzog and C. B. Hare. II. Broncho-pneumonia of cattle: its association with B. Bovisepticus. By P. G. Woolley and W. Sorrell. III. Report on Pinto-Paño Blanco. By P. G. Woolley. IV. Notes on analysis of the water from the Manila water supply. By C. L. Bliss. V. Frambæsia: its occurrence in natives of the Philippine Islands. By P. G. Woolley. *Manila*, 1904. 8°.
Bureau of Government Laboratories, Manila, No 20.

Jobling, James W. AND OTHERS. Texas fever in the Philippine Islands and the Far East. By J. W. Jobling...and P. G. Woolley...The Australian Tick—Boophilus australis Fuller—in the Philippine Islands. By C. S. Banks. *Manila*, 1904. 8°.
Bureau of Government Laboratories, Manila, No. 14.

Jobling, James W. Preliminary Report on the study of Rinderpest of cattle and carabaos in the Philippine Islands. *Manila*, 1903. 8°.
Bureau of Government Laboratories, Manila, No. 4.

Presd. by the Bureau.

Kālidāsa. Kālidāsa. A complete collection of the various readings of the Madras Manuscripts. By the Rev. T. Foulkes. 3 vols. *Madras*, 1904. 8°.

Presd. by the Government of Madras.

Kālisaṅkara Siddhānta Vāgīsa. Kroḍapattrasaṅgraha or critical notes on Anumanajāgadīsī, Pratyakshanumānagādādharī, Pratyakshānumānamāthurī, Vyutpathivāda, Śaktivāda, Muktivāda, Śabdasaktiprakāsika and Kusumānjalī...Edited by Pundit Vindhyesvariprasād Dvivedin...and Nyayacharya Vāmācharana Bhattāchārya. Fasc. I, *etc.*
Benares, 1905, *etc.* 8°.
Chowkhamba Sanskrit Series, No. 90.

Kirkby, William. Practical Prescribing and Dispensing for medical students. *Manchester*, 1904. 8°.
Publications of the University of Manchester, Medical Series, No. 2.

Presd. by the University.

Landon, Perceval. Lhasa. An account of the country and people of Central Tibet and of the progress of the Mission sent there by the English Government in the year 1903-04, *etc.* 2 vols. *London*, 1905. 8°.

Little, A. G. Initia Operum Latinorum quae saeculis xiii, xiv, xv, attribuuntur secundum ordinem alphabeti disposita. *Manchester*, 1904. 8°.
Publications of the University of Manchester, Historical Series, No. 2.

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19. *An Analysis of the Laṅkāvatāra Sūtra.*—*By* PROF. SATIS CHANDRA VIDYĀBHŪṢAṆA, M.A.

The Laṅkāvatāra Sūtra is an ancient Buddhist Sanskrit work, a manuscript of which was brought from Nepal by Mr. Hodgson nearly eighty years ago. It gives an account of a miraculous visit which Buddha paid to Rāvaṇa, the King of Laṅkā. Though the visit was altogether an imaginary one, the book is very valuable as it gives a copious explanation of the Buddhistic metaphysical doctrines as well as an account of several non-Buddhistic sects such as the Lokāyata, Sāṅkhya, Vaiśeṣika, Pāśupata, and others. It is one of the nine most sacred books of the Nepalese Buddhists called their Nava-dhamma.[1]

A Tibetan version of the Laṅkāvatāra Sūtra is found in the Kangyur, Sect. *M*do, Volume V. In Tibetan it is called H̲phags̲-pa-laṅ-kar-gśegs̲-pa-theg-pa-chen-poh̲i-m̲do, in which it is stated that the Sūtra was translated into Tibetan by order of the Tibetan King Ral-pa-can in the 9th Century A.D. Lo-tsa-wa Ge-long (H̲gos̲-chos̲-grub), who translated the Sūtra in Tibetan, also added to the translation a commentary of a Chinese professor named Wen-hi.[2]

There are extant three Chinese translations[3] of the Laṅkāvatāra Sūtra. The first translation, which is incomplete, was made by Guṇabhadra, 443 A.D., the second by Bodhiruci A.D. 513, and the third by S'ikṣānanda A.D. 700-704.

Hwen-thsang, who travelled in Ceylon early in the 7th Century A.D., points out the Malaya mountain as the place wherein Buddha, in olden days, sat to deliver the Laṅkāvatāra Sūtra.[4]

The Sūtra was merely known by name to the Pandits of our country from a reference to it in the Sarvadarśanasaṅgraha[5] of Mādhavācāryya in the 14th Century A.D.

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[1] The nine most sacred books of the Nepalese Buddhists are :—

1. Aṣṭasāhasrikā Prajñāpāramitā ; 2. Gaṇḍavyūha ; 3. Daśabhūmīśvara ; 4. Samādhirāja Sūtra ; 5. Laṅkāvatāra Sūtra ; 6. Saddharmapuṇḍarīka ; 7. Tathāgataguhyaka ; 8. Lalitavistara and 9. Suvarṇaprabhāsa Sūtra.

Divine worship is offered to these nine works by the Buddhists of Nepal. Cf. Hodgson's Illustrations of the Literature and Religion of the Buddhists, p. 19.

[2] *Vide* Csoma de Koros's Analysis of the Kangyur, p. 432 (Asiatic Researches, Volume XX).

[3] *Vide* Bunyiu Nanjio's Catalogue of the Chinese Tripiṭaka, Nos. 175, 176, 177.

The first Chinese translation consisting of 4 fasciculi, 1 chapter, bears two prefaces by Tsiang C'-chi and Su-shi, of the later Suṅ dynasty, A.D. 960-1127. The date of the latter preface corresponds to A.D. 1085. The second Chinese translation consists of 10 fasciculi, 18 chapters. The third Chinese translation consisting of 7 fasciculi, 10 chapters, bears a preface by the Empress Wu-tsö-thien, A.D. 684-705, of the Thāṅ dynasty.

[4] *Vide* Si-yu-ki, Book XI ; Beal's Buddhistic Records of the Western World, p. 251.

[5] Mādhavācāryya quotes a passage from the Laṅkāvatāra Sūtra saying :—

The work consists of ten *Parivarta* or chapters named respectively as, (1) Rāvaṇādhyeṣaṇā, (2) Sarvadharmasamuccaya, (3) Anityatā, (4) Abhisamaya, (5) Tathāgatanityānityatva, (6) Kṣaṇika, (7) Nairmāṇika, (8) Māṃsabhakṣaṇa, (9) Dhāraṇī, and (10) the tenth chapter which bears no special name.

Throughout the Laṅkāvatāra Sūtra the speaker is Buddha himself. The first chapter is addressed to Rāvaṇa while the person spoken to in the remaining nine chapters is Mahāmati. Rāvaṇa, King of Laṅkā, prayed to Buddha for the solution of two questions, *viz.*, (1) what is the distinction between *dharma* and *adharma*; and (2) how could one pass beyond both *dharma* and *adharma*. Buddha's answers to these questions form the subject-

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“तदुक्तं भगवता लङ्कावतारे—

बुद्ध्या विविच्यमानानां स्वभावो नावधार्य्यते ।
अतो निरभिलप्यास्ते निःस्वभावाश्च दर्शिताः ॥
(सर्व्वदर्शनसंग्रह, chapter on बौद्धदर्शन) ।

The passage referred to here occurs with a little variation twice in the Laṅkāvatāra Sūtra (in Chapter II. p. 50, and Chapter X. p. 115 respectively of the Bengal Asiatic Society's manuscript):—

बुद्ध्या विवेच्यमानानां स्वभावो नावधार्य्यते ।
यस्मात् तस्माद् अनभिलाप्यास्ते निःस्वभावाश्च देशिताः ।
(लङ्कावतार सूत्र, २ परिवर्त्त, पृः ५०) ।
बुद्ध्या विवेच्यमानानां स्वभावो नावधार्य्यते ।
यस्मादनभिलाप्यास्ते निःस्वभावाश्च देशिताः ॥
(लङ्कावतार सूत्र, १० परिवर्त्त, पृः ११५) ।

The Tibetan versions of the passages run respectively as follows:—

བློ་ཡིས་རྣམ་པར་གཞིགས་ན་ཡང་།
གང་ཕྱིར་རང་མཞིན་མི་རིག་སྟེ།
དེ་ཕྱིར་དེ་དག་བརྗོད་དུ་མེད།
ངོ་བོཉིད་ཀྱང་མེད་པར་བསྟན།།
(Kangyur, Mdo., Vol. V. Leaf 150, A.S. MSS.)

གང་ཕྱིར་བློ་ཡིས་རབ་གཞིགས་ན།
རང་བཞིན་དག་ནི་མི་དམིགས་ཏེ།
དེ་ཕྱིར་དེ་དག་བརྗོད་དུ་མེད།
ངོ་བོ་ཉིད་ཀྱང་མེད་པར་བཤད།།
(Kangyur, Mdo, Vol. V. Leaf. 253, A.S. MSS.)

“Of things that are discerned by intellect no self-existence can be ascertained; therefore they are shown to be inexplicable and essenceless.”

matter of the first chapter. Thereafter one hundred and eight questions were raised by Mahāmati; Buddha's answers to these are treated in the remaining nine chapters.

Some information about the author of the Laṅkāvatāra Sūtra may be gathered from the following verses occurring in the 10th Chapter of the work :—

माता च मे वसुमतिः पिता विप्रः प्रजापतिः ।
कात्यायनसगोत्रोऽहं नाम्ना वै विरजो [1] जिनः ॥
चम्पायाहं समुत्पन्नः पितापि स पितामहः [2] ।
सोमगुप्तेति नाम्नासौ सोमवंशसमुद्भवः ॥

(A.S. MSS. p. 143).

The Tibetan version of the above runs thus :—

ང་ཡི་མ་ནི་ནོར་ལྡན་དེ།
པ་ནི་བྲམ་ཟེ་སྐྱེ་དགུའི་བདག།
ང་ནི་ཀཱ་ཏྱཱ་ཡ་ནའི་རིགས།
མིང་ནི་རྡུལ་མེད་རྒྱལ་བའོ།།
ཡབ་དང་མེས་དང་ང་བདག་ཀྱང་།
ཡུལ་ནི་ཙམ་པར་སྐྱེས་བ་སྟེ།
མཚན་ནི་ཟླ་བ་སྦས་ཞེས་བྱ།
ཟླ་བའི་རིགས་ལས་དེ་སྐྱེས་སོ།།

(Kangyur, Mdo, Vol. V., Leaf 292-293, A.S. MSS.)

The above passages may be translated thus :—

"My mother is Vasumati, my father the Brahman named Prajāpati; I belong to the same clan as Kātyāyana; my name is Jina, the passionless one, I was born at Campā. Somagupta sprung from the Lunar race is (in fact) my father and he my grandfather too."

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[1] The orig. is **विजितो** which should be **विरजो** for the Tibetan equivalent is རྡུལ་མེད།

[2] The meaning of this line is not clear.

In the tenth chapter Buddha in a prophetic style predicts certain future events which help us in determining the approximate date of the work. Thus he says:—

मयि निर्वृते वर्षशते व्यासो वै भारतस्तथा ।
पाण्डवाः कौरवा नन्दा पश्चात् मौरी भविष्यति [1] ॥
मौर्य्या नन्दाश्च गुप्ताश्च ततो म्लेच्छा नृपाधमाः ।
म्लेच्छान्ते शस्त्रसंक्षोभः शस्त्रान्ते च कलेर्युगः ॥

(A.S. MSS., Leaf 142.)

The Tibetan version runs thus:—

མྱ་ངན་ང་འདས་ལོ་བརྒྱན།
ཀྱ་དང་ཁུར་འཕེལ་དེ་བཞིན་དུ།
བན་ཊ་བ་དང་ཀོའུ་ར་བ།
དགའ་བོའི་འོག་ཏུ་མོའུ་རི་འབྱུང་།
མོའུ་རུ་དགའ་བོ་སྐྱབས་འོག་ཏུ།
ཀླ་ཀློའི་རྗེས་ལ་མཚོན་གྱིས་འཁྲུག།
མཚོན་གྱི་རྗེས་ལ་རྩོད་དུས་སོ།།

(Kangyur, Mdo, Vol. V., Leaf 292, A.S. MSS.)

The passage may be translated thus:—

"One hundred years after my Nirvāṇa, Vyāsa, the author of the Mahābhārata, will flourish. Then the Pāṇḍavas, Kauravas, Nandas and Mauryyas will arise. The Nandas, Mauryyas, Guptas and the Mlecchas, the vilest of kings, will flourish in succession. The Mleccha rule will be followed by tumult of arms and the tumult will be followed by Kali-yuga."

Several non-Buddhistic sects are mentioned thus:—

सांख्या वैशेषिका नग्ना विप्राः पाशुपतास्तथा ।
असत्सद्दृष्टिपतिताः विविक्तार्थविवर्जिताः ॥

(A.S. MSS., Leaf 135.)

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[1] The Sanskrit manuscript reads **वामपश्चात् सौरी** which is evidently wrong. The correct reading has been restored from Tibetan.

"The Sāṃkhyas, Vaiśeṣikas, Nagnas, Vipras and Pāśupatas have taken the extreme views of permanence and non-permanence and are destitute of the discriminated truth."

The views of Kapila and Kaṇāda are specially discussed on leaf 132.

Not merely in the 10th but in some of the previous chapters too the Naiyāyikas and Tārkikas are specially referred to. Thus in Chapter II we read :—

नैयायिकाः कथं ब्रूहि भविष्यन्ति अनागताः ।

(A.S. MSS., Leaf 11.)

The Tibetan version runs thus :—

སྨྲི་བ་རྣམས་ཀུན་ཇི་ལྟ་བུར།
མ་འོངས་དུས་ན་འབྱུང་བ་གསུངས།

"Tell me how in future times the Naiyāyikas will flourish."

The very first question asked by Mahāmati in Chapter II is :—

कथं हि शुध्यते तर्कः कथं तर्कः प्रवर्त्तते ।

(A.S. MSS. Leaf 11.)

The Tibetan version runs thus :—

ཇི་ལྟར་རྟོག་གེ་རྣམ་དག་འགྱུར་།
རྟོག་གེ་ཅི་ཡི་སླད་དུ་འབྱུང་།

(Kangyur, Mdo, Vol. V., Leaf 93, A.S. MSS.)

"How is ratiocination corrected and how does it proceed ?"

The following doctrine of the Tārkikas is specially mentioned :—

कृतकस्य विनाशः स्यात् तार्किकाणामयं नयः ॥

(A.S. MSS., Chap. X., Leaf 143.)

The Tibetan version runs thus :—

བྱས་ན་རྣམ་པར་འཇིག་པར་འགྱུར།
འདི་ནི་རྟོག་གེ་ཅན་གྱི་ཚུལ།།

"Whatever is *Kṛtaka* (produced) is destructible, this is the view of the Tārkikas."

According to the peculiar calculation of the Nepalese Buddhists, the Laṅkāvtāra consists of 3,000 verses. So it is stated :—

कात्यायनसगोत्रोऽहं शुद्धावासाद् विनिःसृतः ।
देशेमि धर्म्मसत्त्वानां निर्वाणपुरगामिनम् ॥
पौराणिकमिदं धर्म्ममहमन्ये तथागताः ।
त्रिभिः सहस्रैः सूत्राणां निर्वाणमिति देशयेत् ॥

(A.S. MSS. Leaf 141.)

"I belong to the clan of Kātyāyana, I am come from the S'uddhāvāsa heaven ; I teach men religion leading to the City of Nirvāṇa. This religion is an old one. I and other Tathāgatas teach this religion by means of 3,000 Sūtras (verses)."

Kātyāyana to whose clan the author of the Laṅkāvatāra belonged, seems to have been the same person who composed the Hindu socio-religious institute called Kātyāyana Dharma Sūtra, for Kātyāyana is mentioned along with Yājñavalkya thus :—

कात्यायनः सूत्रकर्त्ता याज्ञवल्क[1]स्तथैव च ।

(A.S. MSS., Chap. X., Leaf 143.)

The Tibetan version runs thus :—

ཀཱ་ཏྱཱ་ཡ་ན་མདོ་བྱེད་པ།
མཆོད་སྦྱིན་པལ་ཀ་དེ་བཞིན་ཏེ།།

(A.S. MSS., Kangyur, Mdo, Vol. V., Leaf 293.)

"Kātyāyana is an author of Sūtra, so also is Yājñavalkya."

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[1] The Sanskrit manuscript reads यज्ञवर्षे। The reading याज्ञवल्क्य is restored from Tibetan.

20. *Tibet under her Last Kings* (1434—1642 A.D.)—*By Rai* SARAT CHANDRA DAS, *Bahadur*, C.I.E.

About eighty years after Ta*h*i Situ Chyañ Chub Gyal-tshan's annexation of Tsang to the Goverment of Central Tibet, one of the Governors under the Phagmodu Rulers named Rinpûng-Norzang, a native of Tsang, caused a rising of the people against the Phagmo-du authorities, and from the year *tree-hare* of the 7th Cycle, the *Shikha* (towns) of Rinpûng and Samdub-tse (modern Shiga-tse) passed under the authority of Kun-zang Don-dûb-dorje, the two sons of Rinpûng Norzang. They established their power over the whole of Tsang in the year 1434, but nominally acknowledged the supremacy of the Phagmodu Chief. From the year *Earth-tiger* of the 8th Cycle, the Government of Central Tibet had to contend with internal dissensions both in the north and south of Û for which Mi-wang Ne*h*u-dong-pa, the Ruler of Phagmodu, removed his residence to Dansa-thil, the seat of the Phagdu hierarchy. In the year *Iron-ox*, the son of Kunzang named Don-yo-dorje, who was also called Rinpûng Deba Gar-wa, inviting the *Karma* heirarch Choi-tog Gya-tsho of the *Shwa-mar* (Red-Cap sect) invaded Û with ten thousand troops. He drove away Miwang Ne*h*u-dóng-pa from his capital, and took possession of it. In this connexion, it is stated, that though the hierarch of Gahdan had twice tried to turn the tide of victory towards the Ruler of Ne*h*u-dong-tse by propitiating some spirits yet the *Karma-pa* hierarch, his adversary, by superior exorcism made Rinpûng-pa victorious at the end. This heralded the triumph of the *Shwa-mar* (Red-Cap Church) over the Yellow-Church. Thereafter, for suppressing the growing power of Sera and Dapûng monasteries, two monasteries of the Red and Black Cap sects of the *Karma-pa* school were erected under Rinpûng-pa's auspices. This was done with a view to make Sera and Dapúng, the two great Yellow-Church monasteries, to die a natural death for want of support either from the State or from the pious. The *Karma-pa* and *Dûg-pa* sects sent troops to overpower some of the smaller Yellow-Church institutions which, thereby, became converted to the Red-Cap Church. Some of the land endowments of Sera and Dapûng were taken away from them, for which reason the breach between the rival schools became wide. From the year *Earth-ox* to that of *Earth-tiger* in the 9th Cycle, the Lamas of Sera and Dapûng were prevented from taking part in the Monlam Chenpo of Lhasa. But since the year *Fire-dog*, Miwang Ne*h*u-dong-pa, the Chief of Ne*h*u-dong-tse recovered his authority to some extent over the province of Û. Again in the year *Fire-bird* (about 1508) during Gedûn Gyatsho's residence at Methog Thang of Gyal, the Digong-pa Lamas brought troops from Kong-po for crushing down the power of the Yellow Church. When they were about to demolish the outer Dsong (fort) of *H*olkha, the Chief Nangso Don-yod of Dohdah came with his troops for rescuing it. The Digong-pa

Lamas failing to destroy the Dsong, diverted their attention towards Lüng Shoi, *H*od-na, and other places where they succeeded in converting eighteen Gelug-pa (Yellow-Church) institutions into Red-Cap school. In the year *Water-ox* the Yellow-Cap Lamas also sent troops to Kyor-lûng and other places under the *Kahgyud-pa* authorities. In this manner the Lamas of the different sects and schools became involved in civil dissensions. During this period the state of affairs in Tibet resembled the dark days which had followed the successsion of the apostate Langdarma to the throne of Tibet.

The Chiefs of Tsang, who held office under the Phagmodu Rulers of Central Tibet, frequently led their troops to Û to harass the people. They sometimes retired to their own strongholds after defeat, but often quietly annexed parts of their master's territories to their possessions. The Lamas of the Yellow Church struggled for power and to establish their supremacy over Tibet, in which act they met with reverses on account of the powerful help which the Chief of Tsang had given to the Lamas of *Shwa-mar* sects.

In the year 1564, Tshe-wang Dorje, the chief representative of the house of Rinpûng,[1] with his son Padma-Karpo held the fort of Samdub-tse, and having brought the whole of Upper Tsang under his power, declared himself Tsang-toi Gyalpo, the King of Upper Tsang. In the year 1569 (*Iron-horse* of the 10th Cycle) the authorities of Digong fought with those of the monastery of Tag-lûng. In the year *Water-serpent*, there was a rebellion at Kyid-Shoi against the Phagmodu authorities. The Dalai Lama, Gedun Gyatsho, interceding in the affairs brought upon an agreement between the ruler and the ruled. Again afterwards, in the year *Tree-hog* (1574) Rinpûng-pa brought his troops to Kyid-Shoi for creating disturbances, but they were compelled to withdraw from there after they had caused some injury to the people. In the year *Iron-serpent* (1580) internal dissensions again raged in Digong. On Dalai Yontan Gyatsho's return from Mongolia, the *Shwa-mar* hierarch, Ñag-wang Choitag, complimented him with a letter written in verse; but some misapprehension having arisen as to its concealed meaning, Rab Byampa Geleg Lhûndûb and others sent a discourteous reply to it couched in terms which were interpreted as conveying insult to the hierarch. This incident, unfortunately, raked up greater bitterness in the strained relations between the two rival Buddhist Churches of Tibet.

The King of Upper Tsang, with the help of a few petty chiefs of the south and north, incited the Ña-wa Rong people to rebellion, in quelling which, the resources of the Government of Central Tibet were greatly exhausted. Taking advantage of this disturbance he asserted his independence.

In the year *Tree-serpent* heading the troops of the Red and Black-cap Lamas of the *Karma-pa* School, he attacked the military encampment of Deba Kyid-Shoi and killed a large number of Dûngkhors (civil officers) of the Government. On this occasion the *Karma-pa* Lamas became exultant and made a metrical rejoinder to the Dalai Lama's reply by placing their letter before the image of Buddha in the Cathedral of Lhasa. This step, which was meant to be an appeal to show that the *Shwa-mar* hierarch's welcome to the Dalai Lama was sincere, produced disastrous effects. It induced the Yellow-Cap Lamas to invite the help of the Mongolian hordes. About the time that Sonam Namgyal was Deba of Kyi-Shoi, several thousands of Tartar horsemen had already come to Tibet and encamped in the neighbourhood of Lhasa. In the year *Iron-dragon* (1609) the *Karma* hierarch named Phuntshog Namgyal, with his son *Karma* Tan Kyong Wang-po, led the Tsang army to Û, but finding that the Mongol horsemen, that had come to protect the Yellow Church, were waiting for an action, out of fear they quietly withdrew. In the year *Water-mouse* (1611) he brought the whole of Tsang including Gyal-Khar-tse (modern Gyang-tse) and Byang (northernmost province of Tsang) under his power, and became known as Tsang Gyal, *i.e.*, King of Tsang. This was the first instance in which a *Karma* hierarch had marched at the head of a victorious army, having betaken himself to worldly life, and become lord temporal and spiritual.

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[1] Rinpûng or Rinchenpuñg, a small town in the Tsang Rong district. It contained a huge image of Maitreya famous under the name of *Rong-Cham-Chen.*

Later on, again invading Û with the Tsang army, he took possession of Ne*h*u Dong and all the lands, and some of the smaller monasteries of Û. In the seventh month of the year *Earth-hare* (1617), resolving to entirely demolish the Yellow-Cap Church he beseiged Sera and Dapûng and killed many thousand monks. He expelled the Yellow-Cap Lamas from Lhasa. In their discomfiture the Lamas took shelter at Tag-lûng. In the year 1619, that is, shortly after the humiliation of the Yellow-Cap Church and its patron Miwang Ne*h*u Dong-pa, the Mongolian army arrived and met the Tsang army first at Kyang-thang-gang near Lhasa, and ultimately at Tsang-Gyadthang-gang and completely routed them. In the seige of Lhasa, which followed this success of the friends of the Yellow-Church, about 100,000 Tsang men were captured. They all would have been killed had not the Panchen Rinpoche (Tashi Lama of Tsang) timely interceded and procured their release. The monasteries of Sang-ñag Khar and others, besides many Lamas of the Yellow Church that had been taken over to the Red-Cap Church, were restored in 1620 to the Yellow-Church, which got back its lost territorial endowments as well. The king of Tsang and his friend the valiant *Karma* hierarch failing in their military enterprize in Tibet, sought for help from the Mongolian Chiefs who were devoted to the Red-Cap Church. It took them nearly twenty years to consolidate their power in Tibet after the retirement of the Mongolian hordes from Tibet. When they had again grown powerful they began persecuting the Yellow-Church with greater animosity than before.

21. *Note on a Decomposition Product of a Peculiar Variety of Bundelkhand Gneiss.*—*By* C. A. SILBERRAD, B.A., B.Sc., I.C.S.

During the construction of the Ken Canal, my attention was called by the Executive Engineer in charge of the work, to a peculiar soft, white, clayey material found in the low hill on and around which the village of Deora-Bhāpatpūr in the Ajaigarh State is built. The hill is one of the low gneissic hills characteristic of this part of Bundelkhand (*vide* Medlicott and Blandford's 'Geology of India,' Volume I, page 11, *et. seq.*), but appears to be of a somewhat unusual variety of gneiss and one more than usually liable to decomposition. At several places on the sides of this hill, all about half-way up, small pits have been dug into it, and a white clayey material found, which is locally used as "white wash." The same material has been found about 1½ miles south of this in the course of excavating a deep cutting (up to 50 feet deep) for the canal. Both positions are within three or four miles of the head works of the canal, and some ten miles west by south of Ajaigarh town; they are about eight miles north-west from the Vindhyan scarp.

I accordingly obtained some samples and sent them to my brother, Dr. O. J. Silberrad, Ph.D., Research Chemist to the War Office Explosives Committee, who examined them, and through the kindness of a friend had them tested at a pottery as regards the suitability of the clay for the manufacture of earthenware or other pottery. To them I am indebted for all the following information:—

The report is subjoined. Beside the figures showing the results of the chemical analysis, I have added those of Pinite as given in Dana's Mineralogy, which appears to be a somewhat similar material. The occurrence of Titanic Acid in the clay is, however, of interest.

"*Report on Clay from Deora-Bhāpātpūr.*

Analysis of clay is as follows:—

		Clay from Deora-Bhapatpur.	Pinite.
Silica ...	SiO_2	44·40°/₀	49·11
Alumina ...	Al_2O_3	30·47	29·00
Lime ...	CaO	·61	·51
Magnesia ...	MgO	2·89	1·07
Ferric Oxide ...	Fe_2O_3	6·17	9 13
Potash ...	K_2O	8·05	6·84
Soda ...	NaO_2	...	·42
Titanic Acid ...	TiO_2	0·54	...
Combined water and organic matter ...	......	6·14	4·01
Moisture ...		1·10	
Phosphoric Acid ...	P_2O_5	·091	...
		100·461	100·09

The clay was tested for its capacity of forming a china or earthenware in the following manner :—

1. About 20 grams of the dry clay was mixed with sufficient water to give a plastic clay, which was moulded into the form of a triangular pyramid. This was dried at 100°, then baked for 3½ hours in a gas muffle, at a temperature of 890°. The resulting mass was pink in colour, easily broken, possessed little cohesion, was soft and friable.

2. Another portion of the clay was mixed with calcium carbonate, in proportion to give a mixture containing $2^{\circ}/_{\circ}$ added calcium carbonate (19·6 grams clay, ·4 grams $CaCO_3$). This was moistened, kneaded, and the resulting plastic clay formed into a pyramid as before. This was dried at 100°, and heated in a blast muffle, together with the pyramid used in the first experiment (made from clay alone). Pyramids charged into cold muffle and muffle lit at 9-10 A.M., on 8th November, 1904.

Temperature at	11-10 A.M.	...	1155°
,,	,, 12 noon	...	940°
,,	,, 12-30 P.M.	...	1150°
,,	,, 1 P.M.	...	1300°

Heating was then discontinued as one of the pyramids was seen to be sinking, the result of incipient fusion. The muffle was turned out at 1 P.M. Pyramids drawn at 2-15 P.M., and broken.

Clay alone.—Pyramid had sunk considerably. Was smooth, glazed, dirty brown on the outside. The fracture was highly porous and cindery. Heated to a temperature as high as this (1300°), the clay would not be of any use as earthenware.

Clay + $2_{\circ}/^{\circ}$ $CaCO_3$.—The surface of the pyramid was smoother and more highly glazed than that of pyramid just described, and the mass had sunk more, indicating that the clay mixed with $2_{\circ}/^{\circ}$ $CaCO_3$ is more fusible than the clay alone. The colour of the exterior was dark brown. A fracture showed a porous, spongy layer under the surface, then a more compact, blue-black central mass. Useless as earthenware.

3. The earth was made into a plastic clay as before, without any admixture (except water) and formed into a pyramid, and a small dish. These were dried at 100°, charged into cold muffle, and muffle lit at 9-15 A.M., on 9th November, 1904.

Temperature at	11 A.M.	...	1030°
,,	11-30 ,,	...	930°
,,	11-50 ,,	...	1050°
,,	12-25 P.M.	...	1060°
,,	1 ,,	...	1090°
,,	1-30 ,,	...	1130°
,,	2-15 ,,	...	980°
,,	3 ,,	...	950°
,,	3-30 ,,	...	1130°
,,	4-15 ,,	...	1070°

Temperature at	5	A.M.	...	1090°
„	5-25	„	...	1050°

Muffle turned out at 5-30 P.M. Pieces drawn at 9 A.M. on 10th November, 1904. They had not altered in shape, and showed no signs of fusion. They were glazed on the surface, dark brown in colour. Were dense and hard, giving a metallic ring when struck. The fracture showed the pieces to be solid, not porous at all, and was somewhat glassy. The pieces were strong and required a sharp blow to break them.

4. Pyramids were made in the manner previously described, containing respectively $5^{\circ}/_{\circ}$ $CaCO_3$ and $10^{\circ}/_{\circ}$ $CaCO_3$ (19 grams clay + 1 gram $CaCO_3$, and 18 grams clay + grams $CaCO_3$). They were dried at 100°, charged into cold muffle, and muffle lit at 9-20 A.M., 9th November, 1904.

Temperature at	11	A.M.	...	930°
„	11-30	„	...	890°
„	11-50	„	...	910°
„	12-25	P.M.	...	920°
„	1	„	...	930°
„	1-30	„	...	930°
„	2-15	„	...	940°
„	3	„	...	930°
„	3-30	„	...	930°
„	4-15	„	...	900°
„	5	„	...	870°
„	5-25	„	...	860°

Muffle turned out at 5-30 P.M. Pieces drawn at 9 A.M., 10th November, 1904.

Identical results were given by both pyramids. They were pink, not glazed, of only moderate hardness, easily broken, giving a dull fracture. Apparently not strongly enough heated to give a satisfactory earthenware.

The two pyramids were recharged into cold muffle, and muffle lit, at 9-10 A.M., 10th November, 1904. The temperatures were taken with a thermo-couple (all the previous temperatures having been taken in this way) and also with the Wanner Optical pyrometer. The corresponding readings are given below.

			Thermo-couple.	Wanner-Pyrometer.
Temperature at	11 A.M.	...	1040°	...
„	11-30 A.M.	...	970°	...
„	12 noon	...	1090°-1100°	1087°

			Thermo-couple.	Wanner-Pyrometer.
Temperature at	12-30 P.M.	...	1110°-1130°	1132°
„	1 P.M.	...	1090°-1100°	1108°
„	2-15 P.M.	...	1040°-1050°	1052°

When two thermo-couple temperatures are given for the same time, they refer to different points in the muffle.

Muffle turned out at 2-20 P.M. Pieces drawn at 3 P.M.

Pyramid with 5°/$_o$ $CaCO_3$.—This was a dark, coloured, hard, dense mass, glazed on the surface though not so much as the pyramid made from the clay alone, and somewhat lighter in colour. No change of shape could be detected, and there were no signs of fusion. The fracture was glassy in parts, the rest being dull and stony, and was blue to brownish-black.

Pyramid with 10°/$_o$ $CaCO_3$.—This was much lighter in colour than the two previous pieces, was light brown, dull, not glazed. Was not so hard or dense as the Pyramid with 5°/$_o$ $CaCO_3$. The piece was easily broken, giving a dull, sandy fracture, and showing the interior to be fairly compact. The colour of the fracture was a brownish pink. The pyramid had not sunk at all, and showed no signs of fusion.

The best results as regards the making of earthenware appear to be given by employing the clay alone, without any admixture of lime. The addition of lime in small proportions reduces the melting point. The hardness and density of the ware depend on the temperature to which it has been heated. If that temperature has been too high, the upper parts of the pieces are porous and cindery, this probably being due to the liquation of a fusible silicate. The colour of the ware is necessarily dark, owing to the high percentage of oxide of iron in the clay.

It does not appear to be possible to obtain good earthenware from the clay. Experiment III gave the best pieces.

The clay is evidently not Fuller's earth.

When mixed with water, with, or without additional lime, a highly plastic clay is obtained."

In addition to the experiments recorded in the above report, the clay was fired in an ordinary earthenware kiln, but it refused to bind and simply dried to a porous friable mass differing very little from the product obtained by merely moistening it and letting it dry at an ordinary temperature. Heated in an electric furnace to a temperature of about 2900°C the clay melted to fluid which could be easily poured or cast.

From the foregoing it will be seen that the clay is little likely to be of any use except that to which the villagers have put it from time immemorial, *i.e.*, for whitewashing their houses.

JULY, 1905.

UNIVERSITY OF CALCUTTA

The Monthly General Meeting of the Society was held on Wednesday, the 5th July, 1905, at 9-15 P.M.

HIS HONOUR SIR A. H. L. FRASER, M.A., LL.D., K.C.S.I., President, in the Chair.

The following members were present :—

Dr. N. Annandale, Rai Sarat Chandra Das, Bahadur, C.I.E., Mr. L. L. Fermor, Mr. D. Hooper, Mr K. N. Knox, Mr. J. Macfarlane, Dr. M. M. Masoom, Major F. P. Maynard, I.M.S., The Hon. Mr. A. Pedler, Major D. C. Phillott, I.A., Captain L. Rogers, I.M.S., Mr. S. C. Sanial, Mahamahopadhyaya Haraprasad Shastri, Mr. R. R. Simpson, Mr. G. H. Tipper, Pandit Satis Chandra Vidyābhūṣaṇa, Mr. E. Vredenburg, The Rev. A. W. Young.

Visitors :—Mr. Hallowes, Capt W. B. Rennie, I.A.

The minutes of the last meeting were read and confirmed.

Forty presentations were announced.

It was announced that Mr. L. Morshead had expressed a wish to withdraw from the Society.

The General Secretary reported the death of Raja Jayakrishna Das, Bahadur, an Ordinary Member, and Dr. W. T. Blanford, F.R.S., an Honorary Member of the Society.

Read abstracts from programmes from the following Congresses and Exhibition :—

1. From Congrès International d'Expansion Economique Mondiale, 1905.

An International Congress of World-wide Economic Expansion (Congrès International d'Expansion Économique Mondiale) is to be held under the auspices of the Government of Belgium at Mons in September next (1) subscribe, (2) draw up a report, (3) send a delegate. The organisers suggest that the Society would be particularly interested in the section which relates to the following question :—

Which are the best ways of booking observations in uncivilised regions in order to obtain scientific notions on the native, social life, and manners and customs, and raise them to a higher civilization?

2. From Congrès International pour l'étude de la radiologie et de l'ionisation, Liege, 1905.

An International Congress for the Study of Radiology and Ionisation is to be held under the auspices of the Government of

Belgium at Liége in September next, in which the Society is invited to participate.

3. From Indian Industrial and Agricultural Exhibition, Benares, 1905.

A prospectus has been received of the Indian Industrial and Agricultural Exhibition to be held at Benares in connection with the next Indian National Congress.

The President presented the Elliott gold medals and Rs. 75 in cash to each of the following gentlemen for their essays submitted in competition for the Elliott Prize for Scientific Research during 1904:—

1. Babu Sarasi Lal Sarkar—for his essay entitled "On the crystalline properties of a potassium copper ferro cyanide compound," Parts I & II.
2. Babu Surendra Nath Maitra—for his essay entitled "On the Experimental Determination of the Electro-chemical equivalent of nickel." (With Diagrams.)

The President announced:—

1. That the Council had appointed Pandit Satis Chandra Vidyābhūṣaṇa as a member of the Council.
2. That Dr. Annandale had been appointed to serve on the Library Committee and Major D. C. Phillott, I.A., had been re-elected a member of the Philological Commitee during the year.

The General Secretary reported the presentation of nine gold and three silver coins from the Bombay Branch of the Royal Asiatic Society forwarded with their letter dated 15th June, 1905.

Mr. J. N. Das, proposed by Mahamahopadhyaya Haraprasad Shastri, seconded by Pandit Yogesa Chandra Sastree; Mr. Edgar de Montford Humphries, I.C.S., proposed by Mr. R. Burn, seconded by Mr. J. Macfarlane; Babu Amulyacharan Ghose Vidyabhushan, proposed by Pandit Satis Chandra Vidyābhūṣaṇa, seconded by Mr. J. Macfarlane; Mr. Hem Chandra Goswami, proposed by Pandit Yogesa Chandra Sastree, seconded by Mr J. Macfarlane; Mr. J. A. Cunningham, B.A., proposed by Mr. F. Turner, seconded by Mr. G. W. Küchler; Mr. Jain Vaidya, proposed by Pandit Satis Chandra Vidyābhūṣaṇa, seconded by Mr. J. Macfarlane; Pandit Rajendra Nath Vidyabhusan, proposed by Mahamahopadhyaya Haraprasad Shastri, seconded by Babu Muralidhar Banerjee; Babu Vanamali Chakravarti, proposed by Mahamahopadhyaya Haraprasad Shastri, seconded by Babu Muralidhar Banerjee; and Pandit Pramatha Nath Tarkabhushan, proposed by Babu Muralidhar Banerjee, seconded by Mahamahopadhyaya Haraprasad Shastri, were ballotted for and elected Ordinary Members.

The Philological Secretary exhibited a Tibetan Scroll forwarded by the Hon'ble Sir A. T. Arundel, and Pandit Satis Chandra Vidyābhūṣaṇa read a note on it.

The note will be published in the *Memoirs*.

The following papers were read :—

1. *The Catholic Mission in Nepal and the Nepalese Authorities (18th century).—By* FATHER FELIX. *Communicated by the Philological Secretary.*

The paper will not be published by the Society.

2. *Four new Barnacles from the neighbourhood of Java, with Records of Indian Pedunculate Forms.—By* N. ANNANDALE, B.A., D.Sc., *Deputy Superintendent, Indian Museum.*

The paper will be published in the *Memoirs.*

3. *Additions to the collection of Oriental Snakes in the Indian Museum, Part II.—Specimens from the Andamans and Nicobars.—By* N. ANNANDALE, B.A., D.Sc., *Deputy Superintendent, Indian Museum.*

4. *The Tibetan Version of the Pramanasamuccaya—the First Indian work on Logic proper—brought from Tibet by the late Tibet Mission.—By* SATIS CHANDRA VIDYĀBHŪṢAṆA, M.A.

The paper will be published in the *Journal and Proceedings* for August, 1905.

5. *Materials for a Flora of the Malayan Peninsula,* No. 17.—*By* SIR GEORGE KING, K.C.I.E., LL.D., F.R.S., *late Superintendent of the Royal Botanic Garden, Calcutta, and* J. S. GAMBLE, C.I.E., F.R.S., *late of the Indian Forest Department.*

(Abstract.)

This contribution commences with Natural Order *Myrsineæ* and is continued by *Sapotaceæ*, *Ebenaceæ*, *Styraceæ* and *Oleaceæ*. The draft of *Ebenaceæ* was prepared by Sir George King, that of the other Orders by Mr. J. S. Gamble; but the new species are given under their joint names.

In the Natural Order *Myrsineæ* 7 genera are described with 80 species, of which the large genus *Ardisia* furnishes 47. The new species are 36 in number, viz., *Mæsa impressinervis* and *pahangiana*; *Myrsine perakensis* and *Wrayi*; *Embelia Scortechinii*, *angulosa*, *Ridleyi*, and *macrocarpa*; *Labisia paucifolia* and *longistyla*; *Ardisia chrysophyllifolia*, *solanoides*, *fulva*, *lankawiensis*, *labisiæfolia*, *montana*, *sinuata*, *platyclada*, *Kunstleri*, *Scortechinii*, *oblongifolia*, *tetrasepala*, *biflora*, *tahanica*, *Wrayi*, *minor*, *perakensis*, *Meziana*, *Ridleyi*, *rosea*, *longipedunculata*, *Maingayi*, *theæfolia*, and *bambusetorum*; and *Antistrophe caudata* and *Curtisii*. A Tenasserim novelty has also been described *Embelia Gallatlyi*. The working out of the Malay plants of this difficult Order has been rendered easier owing to the recent Monograph of the Order by Herr Carl Mez, in Engler's *Pflanzenreich*.

In the interesting and important Natural Order *Sapotaceæ* there are 8 genera with 49 species, of which 25 are new, viz., *Sideroxylon Derryanum*; *Isonandra perakensis* and *rufa*; *Payena longepedicellata* (Brace), *Havilandi*, *sessilis*, *obtusifolia* and *selangorica*; *Bassia aristulata*, *Kingiana* (Brace), *Kunstleri* (Brace), *penicellata*, *Curtisii*, *laurifolia*, *rupicola*, *perakensis*, *Braceana*, *longistyla*, *cuprea*, *penangiana*, and *erythrophylla*; *Palaquium Ridleyi*, *microphyllum*, *Herveyi* and *stellatum*. An Andaman Islands species has also been included, *Mimusops andamanensis*. Some of the species, it will be noticed, bear the name given in the Calcutta Herbarium by Mr. L. R. Brace, formerly Curator; but he merely gave names without descriptions.

In the almost equally important Natural Order *Ebenaceæ* there are two genera with 42 species, of which 24 are new, viz., *Maba Hierniana*, *venosa*, *olivacea*, *Clarkeana* and *perakensis*; *Diospyros Wrayi*, *sub-rhomboidea*, *dumosa*, *Scortechinii*, *Styraciformis*, *tristis*, *pauciflora*, *ellipsoidea*, *Wallichii*, *toposioides*, *brachiata*, *Kunstleri*, *nutans*, *reflexa*, *penangiana*, *rufa*, *areolata*, *Curtisii*, and *glomerulata*.

The Natural Order *Styraceæ* gives two genera and 28 species, of which 25 belong to *Symplocos*. The new species are 8 in number, viz., *Symplocos fulvosa*, *pulverulenta*, *monticola*, *Ridleyi*, *perakensis*, *Brandiana*, *penangiana*, *Scortechinii*. As was the case with *Myrsineæ*, so in *Styraceæ* also, the work has been facilitated by the recently published Monograph by Herr Brand in Engler's *Pflanzenreich*.

In the Natural Order *Oleaceæ* there are 5 genera with 22 species, of which 9 are new. These are: *Jasminum Wrayi*, *Curtisii*, *longipetalum* and *Scortechinii*; *Osmantum Scortechinii*; *Linociera paludosa* and *caudata*; and *Olea platycarpa* and *ardisioides*.

In this part, therefore, are described 5 Natural Orders with 24 genera and 221 species. The number of species new to science are 115, and two new species have been also described from regions adjacent to that to which the work refers.

The paper will be published in full as an Extra Number of the *Journal and Proceedings*.

22. *Additions to the Collection of Oriental Snakes in the Indian Museum.—Part 2.—Specimens from the Andamans and Nicobars.*—*By* NELSON ANNANDALE, B.A., D.SC., *Deputy Superintendent of the Indian Museum.*

All the snakes recorded or described in this communication are from the Andamans or the Nicobars. With one exception, they have been collected and presented to the Museum either by Major A. R. Anderson, I.M.S., or by Mr. C. G. Rogers. The one exception is the type of a new Sea-Snake, which was taken by the Indian Marine Survey. Mr. G. A. Boulenger has kindly examined several of the other specimens. I am much indebted to Major Anderson for several letters on the snakes of the islands. I have added a revised list of the species known to occur in the two archipelagoes or represented from them in the Indian Museum, having re-examined the specimens recorded by Mr. W. L. Sclater in all cases in which there was any doubt.

TYPHLOPIDÆ.

TYPHLOPS BRAMINUS (Daud.)

This is evidently the common species in the Andamans, or at any rate in the neighbourhood of Port Blair. Major Anderson has lately sent us twenty-four very dark specimens from that station.

The type of *T. andamanensis* still remains unique, if it is in existence. I have not been able to trace its history. The Museum does not possess examples of *T. oatesii*, described from the Cocos group.

COLUBRIDÆ.

LYCODON AULICUS (Linn.)

We have lately received several specimens of this common Indian species both from the Andamans and the Nicobars. One from the Nicobars belongs to var. E of Boulenger's "Catalogue;" those from the Andamans to var. C, a common form in Ceylon.

OLIGODON WOODMASONI (Scl.)

Simotes woodmasoni, *Sclater*, *J.A.S.B.*, (2) LX, p. 235; *List. Snakes*, p. 24.

A young specimen, lately received from Major Anderson, has been submitted to Mr. Boulenger, who regards it as belonging to the genus *Oligodon*. I have compared it with Mr. Sclater's types, with which it is identical. Mr. Boulenger notes that it is nearly related to *O. trilineatus*, a Malayan species.

COLUBER MELANURUS, Schleg.

A specimen from the Andamans has the entire dorsal surface of the head and body of an almost uniform dark plumbaceous grey. The markings on the side of the head and on the neck are, however, quite distinct, and the individual is otherwise normal. We have in the Museum a similar specimen from Borneo.

DENDROPHIS PICTUS (Gmel.)

A specimen has been sent by Mr. Rogers from Henry Lawrence Island, Andamans. The species appears to be common all over the Andamans and Nicobars. Some of the Andaman specimens, are very dark in colour, but this character does not seem to be constant.

TROPIDONOTUS PISCATOR (Schneid.)

We have lately received a specimen from the South Andamans, while we had already a number from several localities in the archipelago. I have not been able to find any record of the occurrence of this common Indian species in the Nicobars.

TROPIDONOTUS NICOBARENSIS, Scl.

T. nicobaricus *Sclater, J.A.S.B.*, LX (2), 1891, pp. 231, 250.
T. nicobarensis, *id.*, *ibid*, p. 241.
T. nicobariensis, *Boulenger, Cat. Snakes*; p. 192.

The type of this species still remains unique. I have examined it very carefully, dissecting out the maxillary on one side, and have no doubt that Mr. Sclater was right as to its generic identification. The maxillary teeth, 24 in number, increase slightly from before backwards, and show no signs of being stunted posteriorly; but the division of the anal plate appears to me to have been traumatic. If the species is identical with Cope's *Prymnomiodon*, the latter must have been founded on an individual injured or abnormal as to its dentition. This seems possible, as the type was otherwise deficient.

DIPSADOMORPHUS CEYLONENSIS, Gthr.

Mr. Rogers has presented two specimens from the South Andamans. The snakes from Assam and the Andamans identified by Mr. Sclater as *Dipsas fusca*, are young individuals of this species.

DISTIRA ANDAMANICA, sp. nov.

Head moderate, hardly separated from the neck; the greatest depth of the latter half that of the body; body deep, strongly compressed; tail short. Rostral much broader than deep; nasals shorter than frontal, three times as long as the suture between the præfrontals; frontal not much longer than broad, shorter than distance from rostral, much shorter than parietals; one præocular, very large; 3 postoculars; no loreal; 2 large, superimposed anterior temperals; 7 upper labials, 3rd and 4th entering eye; two pairs of sub-equal chin shields, the posterior pair separated from one another by two rows of scales. Head scales smooth for the most part, but with a few minute, irregularly placed pits. Eyes large and prominent. Body scales imbricate, but feebly so or not at all posteriorly, with a very short keel or a tubercle; 31 scales round neck, 39 round body; ventrals distinct, bituberculate, with a central longitudinal groove, occasionally divided, 238 (in the type) in number. *Colour*—pale-yellow on sides and belly, with about 40 large, black rhomboidal marks on the dorsal surface. These are not in contact either above or below, reaching about half way down the body on the neck and tail and almost to the ventral margin of the tail. Throat and chin darker yellow, the former feebly irrorated with black. Dorsal surface of the head pale-green as far backwards as the posterior border of the præfrontals and of the 2nd supraocular, black posteriorly

Measurements of type—

Total length	30 inches.
Length of tail	$2\frac{3}{4}$ „

A single female from the Andamans. Judging from its bold coloration, this specimen is immature. In many respects the species resembles *Enhydris curtus*, from which it may be distinguished superficially by the possession of unbroken parietals and distinct chin shields. It has six grooved teeth posterior to the large poison fangs in each maxilla. Its nearest ally is *D. lapimidoides*.

SNAKES OF THE ANDAMANS AND NICOBARS.

NAME OF SNAKE.	Andamans.	Nicobars.
Typhlops braminus§‖ (Daud.)	×	—
Typhlops oatesii,* Blgr.	×	—
„ *andamanensis*,* Stol.	×	—
Python reticulatus,§‖ Schneid.	—	×
Lycodon aulicus§‖ (Linn.)	×	×
Polydontophis sagittarius§‖ (Cant.)	—	×
„ bistrigatus‖ (Gthr.)	—	×
Ablabes nicobarensis,* Stol.	—	×
Oligodon sublineatus, D. & B.	—	×
„ woodmasoni* (Scl.)	×	×
Zamenis mucosus§‖ (Linn.)	×	—
Coluber porphyraceus, §‖ Cant.	×	—
„ melanurus§‖ (Schleg.)	×	×
„ oxycephalus,§‖ Boie	×	×
Dendrophis pictus§‖ (Gmel.)	×	×
Tropidonotus stolatus§‖ (Linn.)	—	×
„ piscator§‖ (Schneid.)	×	—
„ nicobarensis,* Scl.	—	×
Chrysydrus granulatus §‖ (Schneid).	×	—
Dipsadomorphus hexagonatus (Blyth)	×	—

NAME OF SNAKE.	Andamans.	Nicobars.
Dipsadomorphus ceylonensis,‖[1] Gthr.	×	—
Chrysopelea ornata§‖[2] (Shaw)	(Narcondam)	—
Cerberus rhynchops§‖ (Schneid.)	×	×
Fordonia leucobalia §‖ (Schleg.)	—	×
Bungarus cæruleus §‖ (Schneid.)	×	—
Naia tripudians,§‖ Merr.	×	—
,, bungarus,§‖ Schleg.	×	—
Platurus colubrinus§‖ (Schneid.)	×	×
Distira andamanica,* Annand.	×	—
Hydrus platurus§‖ (Linn.)	—	×
Amblycephalus monticola‖ (Cant.)	—	×
Lachesis cantoris* (Blyth)...	×	×
,, gramineus§‖ (Shaw)	×	×
,, purpureomaculatus§‖ (Gray)	×	×

In the above list, the names of those snakes which are not represented in the Indian Museum by specimens either from the Andamans or from the Nicobars are printed in italics. In the first column a * indicates that a species is peculiar to the Andamans, the Nicobars or both archipelagoes; a § that it has been recorded from the Malay Peninsula south of the Isthmus of Kra; a ‖ that it is known from Assam or Burma. In the other columns, a × shows that a species is known to occur, a – that specimens have not been taken.

It will be seen from this list that the Ophidian fauna of the islands has close affinities with that of Burma and Malaya, while there is possibly a less obvious connection with Ceylon. So far as we know, three species are peculiar to the Andamans, two to the Nicobars, and two to the Andamans and Nicobars together; but our knowledge is still extremely limited, especially as regards the smaller snakes of the Nicobars.

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[1] *Dipsas fusca* (Gray) *apud* Sclater, *List Snakes*, p. 47.

[2] Major Anderson has taken a specimen (var. A) on Narcondam.

AUGUST, 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 2nd August, 1905, at 9-15 P.M.

The REV. E. FRANCOTTE, S.J., in the chair.

The following members were present:—

Mr. J. Bathgate, Mr. L. L. Fermor, Babu Amulyacharan Ghosh Vidyabhushan, Mr. H. G. Graves, Mr. T. H. Holland, Mr. D. Hooper, Pandit Navakanta Kavibhushana, Mr. J. Macfarlane, Mr. H. H. Mann, Dr. M. M. Masoom, Major F. P. Maynard, I.M.S., Mr. G. E. Pilgrim, Captain L. Rogers, I.M.S., Dr. E. D. Ross, Pandit Yogesa Chandra Sastree, Mahamahopadhyaya Haraprasad Shastri, Mr. R. R. Simpson, Mr. H. E. Stapleton, Pandit Pramatha Nath Tarkabhushan, Mr. G. H. Tipper, Pandit Vanamali Vedanta Tirtha, Pandit Jogendra Nath Vidyabhushan, Pandit Rajendra Nath Vidyabhushan, Pandit Satis Chandra Vidyabhushan, the Rev. A. W. Young.

Visitors:—Babu Sarat Kumar Das, Mr. W. R. LeQuesne.

The minutes of the last meeting were read and confirmed.

Fifty presentations were announced.

It was announced that Major E. H. Brown, I.M.S., had expressed a wish to withdraw from the Society.

The Chairman announced that Mr. H. E. Stapleton had been appointed to officiate as Anthropological Secretary of the Society during the absence of Dr. N. Annandale.

The Chairman also announced that the following gentlemen being largely in arrears of subscription had been declared defaulters and that their names would be posted up in accordance with Rule 38.

Mr. R. G. Black.
Babu Ramani Mohan Mallick.
Babu Jaladhi Ch. Mukerjee.

With reference to the resolution of the Council regarding the rejection of certain books from the Society's library published in the Society's Proceedings for June, 1904, the Chairman announced that the Council had resolved that the Library Committee should settle the prices of books with authority to offer Government publications to Government.

The Chairman presented to Rai Sarat Chandra Dass, Bahadur, C.I.E., a diploma from the Imperial Russian Archæological Society electing him a Foreign Corresponding Member.

Sri Kripamaya Dev Anang Bhim Kesori Gajapati Maharaja, proposed by Mahamahopadhyaya Haraprasad Shastri, seconded by

Mr. J. Macfarlane; Lieut.-Col. C. P. Lukis, M.B., F.R.C.S., I.M.S. proposed by Captain L. Rogers, I.M.S., seconded by Captain J. W. Megaw, I.M.S.; Captain D. McCay, M.B., I.M.S., proposed by Captain L. Rogers, I.M.S., seconded by Captain J. W. Megaw, I.M.S.; Lieut. C. A. Gourlay, M.B., I.M.S., proposed by Captain L. Rogers, I.M.S., seconded by Captain, J. W. Megaw, I.M.S.; Captain J. J. Urwin, M.B., I.M.S., proposed by Captain L. Rogers, I.M.S., seconded by Captain J. W. Megaw, I.M.S.; Captain W. W. Clemesha, M.B., I.M.S., proposed by Captain L. Rogers, I.M.S., seconded by Captain J. W. Megaw, I.M.S.; were ballotted for and elected Ordinary Members.

Owing to non-receipt of the MS. of the paper entitled "The Tibetan version of the Pramāṇasamuccaya," by Prof. Satis Chandra Vidyābhūsaṇa, read at the July General Meeting, the paper is not published in the *Journal* and *Proceedings* for August 1905.

The following papers were read :—

1. *A Tibetan Chart containing the charm of Vajrabhairava.—By* Prof. Satis Chandra Vidyabhushan, M.A.

The paper will be published in the Memoirs.

2. *History of Nyāyaśāstra from Japanese sources.—By* Mahamahopadhyaya Haraprasad Shastri, M.A.

3. *Notes concerning the people of Mungeli Tehsil, Bilaspore District.—By* Rev. E. M. Gordon. *Communicated by the Anthropological Secretary.*

4. *Amulets as Agents in the Prevention of Disease in Bengal.—Communicated by* Mr. A. N. Moberly, I.C.S., *Superintendent of Ethnography, Bengal.*

The paper will be published in the Memoirs.

5. *A Short History of the house of Phagmodu, which ruled over Tibet on the decline of Sakya for upwards of a century till 1432, A.D.—By* Rai Sarat Chandra Das, Bahadur, C.I.E.

6. *Additions to the Collection of Oriental Snakes in the Indian Museum. Part 3.—By* N. Annandale, B.A., D.Sc.

7. *The Kantabudiyas of Cuttack.—By* Jamini Mohan Das. *Communicated by the Anthropological Secretary.*

8. *The Age of Jimuta Vahana.—By* Pandit Pramatha Nath Tarkabhushan.

The paper will be published in the Bibliotheca Indica.

9. *Sal-Ammoniac: a Study in Primitive Chemistry.—By* H. E. Stapleton, B.A., B.Sc.

The paper will be published in the *Memoirs.*

10. *Alchemical Equipment in the Eleventh Century, A.D.—By* H. E. Stapleton *and* R. F. Azo.

The paper will be published in the *Memoirs.*

11. *Note on the Bhotias of Almora and British Garhwal.—By* C. A. Sherring, M.A., I.C.S. *Communicated by* Mr. R. Burn, I.C.S.

The paper will be published in the *Memoirs.*

LIBRARY.

The following new books have been added to the Library during September, 1905.

Amira, Karl V. Konrad von Maurer. Gedächtnisrede, *etc.* *München*, 1903. 4°.

Presd. by the K. B. Akademie der Wissenschaften zu München.

Baron, Kr, and **Wissendorff,** H. Chansons nationales lalaviennes. vol. I, *etc.* *Mitau*, 1894, *etc.* 8°.

Presd. by the Académie Impériale des Sciences de St. Pétersbourg.

Bölsche, Wilhelm. Die Abstammung des Menschen. Zwanzigste Auflage. *Stuttgart*, [1904.] 8°.

Presd. by "Kosmos, Gesellschaft der Naturfreunde," Stuttgart.

Briggs, Ella Marion. The Life History of Case Bearers. *Brooklyn, N.Y.*, 1905, *etc.* 8°.
Cold Spring Harbor Monographs. IV.

Presd. by the Brooklyn Institute of Arts and Sciences.

BRITISH MUSEUM.—*Natural History.* Guide to the Gallery of Birds in the department of Zoology, *etc.* *London*, 1905. 4°.

Presd. by the Museum.

BRUSSELS.—*Institut International de Bibliographie.* Manuel du Répertoire bibliographique universel.
[*Bruxelles,*] 1905. 8°.

Presd. by the Institut.

CALIFORNIA ACADEMY OF SCIENCES, *San Francisco.* Constitution and Bye-laws, *etc.* *San Francisco*, 1904. 8°.

Presd. by the Academy.

CANADA.—*Department of the Interior.* Relief map of the Dominion of Canada. 1904. *S. sh.* fol.

Presd. by the Department.

Carvalho, Cyro Augusto de. Collection Cyro Augusto de Carvalho; monnaies et médailles portugaises. [Sale catalogue.] *Amsterdam,* 1905. 8°.

Presd. by Herr J. Schulman.

Conard, Henry S. The Waterlilies. A monograph of the genus Nymphaea. [*Baltimore,*] 1905. 4°.

Presd. by the Carnegie Institution of Washington.

Cotton, Julian James. List of Inscriptions on tombs or monuments in Madras, possessing historical or archæological interest. *Madras,* 1905. 4°.
Indian Monumental Inscriptions, vol. III.

Presd. by the Govt. of Madras.

Curtiss, Samuel Ives. Primitive Semitic Religion to-day. A record of researches, discoveries and studies in Syria, Palestine and the Sinaitic Peninsula. *Chicago,* 1902. 8°.

Danzig.—*Naturforschende Gesellschaft.* Katalog der Bibliothek. *etc.* Heft I, *etc.*
Danzig, 1904, *etc.* 8°.

Presd. by the Society.

Dimon, Abigail Camp. The Mud Snail: Nassa obsoleta.
Brooklyn, N.Y., 1905. 8°.
Cold Spring Harbor Monographs. V.

Presd. by the Brooklyn Institute of Arts and Sciences.

ENGLISH-GARO Dictionary by members of the Garo Mission of the American Baptist Missionary Union, Tura, Assam. [By M. C. Mason.] *Shillong,* 1905. 8°.

Presd. by the Chief Commissioner of Assam.

Folkmar, Daniel. Album of Philippine Types...Christians and Moros...Eighty Plates, representing thirty-seven provinces and Islands. Prepared and published under the auspices of the Philippine Exposition Board by Daniel Folkmar.
Manila, 1904. *Obl. fol.*

Presd. by the Philippine Govt., Manila.

Foster, J. E. Churchwarden's Accounts of St. Mary the Great, Cambridge, from 1504 to 1635. Edited by J. E. Foster.
Cambridge, 1905. 8°.

Presd. by the Cambridge Antiquarian Society.

Frazer, J. G. Totemism. *Edinburgh*, 1887. 8°.

Friedrich, Johann. Gedächtnisrede auf Karl Adolf von Cornelius.
München, 1904. 4°.

Heigel, K. Th. von. Zum Andenken an Karl von Zittel.
München, 1904. 4°.

Presd. by the K. B. Akademie der Wissenschaften zu München.

Htoon-Chan. The Arakanese Calendar with the corresponding dates in Burmese and English, 1820-1918. *Akyab*, 1905. 4°.

Presd. by the Author.

Jyotis'chandra Bhattacherjee. লীলাবসান । [Lilāvasāna.]
[*Calcutta*, 1905.] 8°.

Presd. by the Author.

Kalecsinszky, Alexander v. Über die Akkumulation der Sonnenwärme in verschiedenen Flüssigkeiten.
Leipzig, 1904. 8°.

Sonderabdruck aus dem Mathematischen und Naturwissenschaftlichen Berichte aus Ungarn. XXI.

Presd. by the Author.

Krumbacher, K. Das Problem der neugriechischen Schriftsprache. *München*, 1903. 4°.

Presd. by the K. B. Akademie der Wissenschaften zu München.

La Flotte, de. Essais historiques sur l'Inde, précédés d'un Journal de voyages et d'une description géographique de la côte de Coromandel. *Paris*, 1769. 12°.

Meyer, M. Wilhelm. Weltschöpfung. Wie die Welt entstanden ist. *Stuttgart*, [1905 ?] 8°.

——Wie kann die Welt einmal untergehen ? *Stuttgart*, [1905 ?] 8°.
Presd. by "Kosmos, Gesellschaft der Naturfreunde," Stuttgart.

NYĀYABINDU. [Buddhist Text-book of Logic, composed by Darmkirta with a commentary thereto.] Nyayabindu-tika, [composed by Darmottar. Tibetan translation edited with introduction by F. I. Sherbolski.] Fasc. I. *etc.*
St. Petersburg, 1904, *etc.* fol.

Presd. by the Académie Impériale des Sciences de St. Pétersbourg.

Pringsheim, Alfred. Ueber Wert und angeblichen Unwert der Mathematik. *München*, 1904. 4°.

Presd. by the K. B. Akadémie der Wissenschaften zu München.

Smallwood, Mabel E. The Salt-Marsh Amphipod: Orchestia palustris. *Brooklyn, N.Y.*, 1905. 8°.
Cold Spring Harbor Monographs. III.

Presd. by the Brooklyn Institute of Arts and Sciences.

Wildeman, E. de. Mission Emile Laurent—1903-1904—. Énumération des plantes récoltées par Émile Laurent avec la collaboration de M. Marcel Laurent pendant sa dernière mission au Congo. *Bruxelles*, 1905. 4°.

Presd. by the Congo State.

Willcocks, Sir William. The Nile in 1904.
London, New York, Cairo, 1904. 8°.

Presd. by the Govt. of India, Home Dept.

Wollaston, Arthur N. A complete English-Persian Dictionary compiled from original sources. *London*, 1904. 4°.

Woolley, Paul G. and **Jobbing** J. W. A Report on Hemorrhagic Septicaemia in animals in the Philippine Islands. *Manila*, 1904. 8°.
Bureau of Government Laboratories, Manila, No. 9.

Presd. by the Bureau.

Zartusht-i-Bahrâm ben Pajdû. Le Livre de Zoroastre—Zarâtusht Nâma—de Zartusht-i-Bahrâm Ben Pajdû, publié et traduit par F. Rosenberg. *St. Pétersbourg*, 1904. 8°.
Presd. by the Académie Impériale des Sciences, St. Pétersbourg.

Zell, Th. Ist das Tier unvernünftig? Neue Einblicke in die Tierseele. *Stuttgart*, [1903.] 8°.

Presd. by "Kosmos, Gesellschaft der Naturfreunde," Stuttgart.

23. *History of Nyāyaśāstra from Japanese Sources.*—*By* MAHĀMAHOPĀDHYĀYA HARAPRASĀD SHĀSTRĪ.

The bibliography of Nyāyaśāstra of the Orthodox Hindus is a very short one. It consists of :—

(1) The Sūtras attributed to Gautama or Akṣapāda.
(2) Bhāṣya attributed to Vātsyāyana.
(3) Vārtika by Uddyotakara.
(4) Tātparyaṭīkā by Vācaspati.
(5) Pariśuddhi by Udayana.

But the bibliography of the Buddhist Nyāyaśāstra, as known in China and Japan, is a long list. It attributes the first inception of the Nyāyaśāstra to Shok-mok or Mok-shok which, transliterated into Sanskrit would be Akṣapāda.

The second author who treated of Nyāya is said to be Buddha himself. The third is Ryuju, who is said to have preached the Mahāyāna doctrines of Buddhism with great success. His Hoh-ben-shin-ron is one of the polemical works against heretics. It contains one volume on logic. The fourth is Mirok (Maitreya). The fifth Muchak (Asanga), Mirok's disciple. Muchak's younger brother Seish (Vasubandhu) wrote three books on Logic—Ronki, Ron-shi-ki, and Ron-shin. After Vasubandhu, came Maha Diṅnāga and his disciple Saṅkarasvāmī, whose works were translated into Chinese, by the great Hienth Sang. Hienth Sang had two great disciples—Kwei-ke in China, and Doh-Soh in Japan. Kwei-ke's "Great commentary" is the standard work on Nyāya in China and Doh-Soh is the first promulgator of Buddhist doctrines and Nyāya Sāstra in Japan. Since then there had been many distinguished teachers of Nyāya both in China and in Japan, and up to the present day Diṅ-nāga has a firm hold on the learned people both in China and Japan. The European system of logic is a very recent introduction in Japan, where Diṅ-nāga is still studied.

In the two paragraphs given above, I have tried to give the bibliography of Brahmanic and Buddhistic logic of ancient India. Both attribute the invention of the science to one person, namely, Akṣapāda. The only clue given about this personage's chronology is that it was before Buddha. But no clue of his time can be found in Brahminical works. Mr. Justice Pargiter tells me that there is no such person as Akṣapāda mentioned in the Mahabharata, which was in a nascent condition about the time of Buddha's birth. The Chinese attribute to him two things, namely, "Nine Reasons" and "Fourteen Fallacies," while the Hindus attribute to him the entire body of Sûtras divided into five Adhyāyas, ten lectures, eighty-four topics, five hundred and twenty-eight sūtras, seventeen hundred and ninety-six words, eight thousand three hundred and eighty-five letters. It may be said, in passing, that the Chinese people are doubtful about the "Nine-Reasons" being attributed to Akṣapāda. It may also be remarked that in the whole body of Sūtras, there is nothing which corresponds to the "Nine Reasons" and "Fourteen Fallacies," which, we know from Chinese sources, and which even Diṇ-nāga is said to have attributed to Soc-mock. An examination of the "Nine Reasons" reveals the fact, that it is historically prior to the invention of syllogism. It means an effort of the human mind to exhaust all possible forms of the relation between, what is now called the Major Term and the Middle Term of a syllogism. And such an examination must precede the formulation of syllogism. In what light the later writers have seen this examination, and what conclusions may be drawn from it, need not trouble us here. Suffice it for a historical student to know, that this early effort is attributed to Soc-mock, universally known as the first writer on Nyāya. The theory of "Fourteen Fallacies" too, in their crude and undeveloped shape, shows signs of greater antiquity than the Nyāya Sūtras.

These two theories of Akṣapāda seem to have been the common property of Indian pandits before Buddha's time, as Buddha did not scruple to take advantage of these.

The "Nyāya Sūtras," as we have them, seems to be a much later production. Haribhadra, a Jain scholar of the 6th Century A.D., says that it is a sectarian work; that the sect, which either composed it or adhered to it, was a Saiva sect. Now a Saiva or Mahesvar sect existed long before Buddha. Soc-mock and the eighteen gurus of the sect, Nakulisha and others, might have belonged to this sect. That the Sūtras were not composed by Akṣapāda appears to be almost certain. But it bears his name. How to explain this fact? The only explanation is that it belonged to that sect, of which he was thought to be one of the earliest representatives. I am not sure if the work "Nyāyasūtra" had not gone through several redactions before it assumed its present shape. But it is pretty sure that from the time of Soc-mock to the period when the Nyāyasūtras were reduced to their present form, India was full of polemical writings, much of which has perished.

Though we know nothing from Brahmanical sources of the process of the development of Nyāya, we know some stages of this development from the Buddhists. Nāgārjuna and Maitreya wrote on Nyāya. In fact one of the volumes, I believe, the fifteenth of the great polemical work by Nāgārjuna on Upāyakauśalya is devoted to the exposition of Nyāya. Maitreya, Asanga and Vasubandhu —all wrote on Nyāya. Then came the great Diṅ-nāga, the disciple of Asanga, whom the Japanese place between 400 to 500 A.D., and Kern between 520 and 600.

But in the meanwhile on the Brahminical side the Sūtra has been reduced to its present shape and a Bhāṣya has been composed when, nobody can say. If am permitted to hazard a conjecture, both the Sūtra and Bhāshya came after the development of the Mahāyāna School, *i.e.*, both came after Nāgārjuna and Aryadeva, say in the 2nd Century A.D. The Bhāṣyākara, Vātsyāyana, though he does not even mention the Buddhists or even any Buddhist writers, pointedly refutes all the Mahāyānists doctrines of

Transitoriness, of Void, of Individuality, and so on. Sāvara, the Bhāṣyakāra of Mīmānsā, was liberal enough to speak of refuting the Mahāyānic theory that the whole is merely a collection of parts and not in any way different from them. But Vatsāyana is not so liberal. He would not name the Buddhists. There is another Vātsyāyana, however, who flourished about this time. He may be identical with or a relation of, or at least, have belonged to the same gotra with the Nyāya Bhāṣyakara," on the supposition that families and clans rise into importance under one political circumstance and then disappear from history, both Vātsāyanas may be said to have belonged to the same epoch. That Vātsyāyana is the celebrated writer on Eratics. He mentions some scandals about the Sātavāhanas who flourished by the middle of the 2nd Century A.D. And the geographical information gleaned from his book cannot refer to a period later than the rise of the Gupta family.

We glean one historical information from the Brahmanical sources, namely, that Diṅ-nāga severely criticised the Bhāṣyakāra Vātsyāyana, and that the Vārtikakāra, who comments upon the Bhāṣya, defends Vātsyāyana's work against Diṅ-nāga.

The modern Hindu idea is that the Buddhists believed in two of the pramānas only, namely, *Pratyakṣa* and *anūmana*, *i.e.*, perception and inference. But this is not a fact, so far as early Buddhism and even early Mahāyānism are concerned. For we know distinctly from Chinese and Japanese sources that Analogy and Authority were great polemical instruments in the hands of the early Buddhists, *i.e.*, that all early Buddhists from Buddha to Vasubandhu were indebted to Akṣapāda for their pramāṛas or polemical instruments of right knowledge. Maitreya discarded Analogy, and Diṇ-nāga discarded Authority, and made Nyāya pure logic, in the English sense of the term.

The followers of Akṣapāda are sometimes called Yogins, and Yaugas, and the Buddhist tradition is that Mirock (Maitreya) introduced Yoga in the system of discriminating true knowledge from false (*i.e.*, the system of Akṣapāda), some form of Yoga. And we find that at the second lecture, fourth chapter, of the Nyāya Sūtras, there is a long section devoted to Yoga, and that Yoga is of a peculiar character. How the section on Yoga was adopted into the Nyāyaśāstra, it is is difficult to say, because Yoga does not belong to the sixteen topics which Akṣapāda, in the first sūtra, promises to expatiate upon. Whether properly or improperly introduced, it forms a part of Hindu Nyāyaśastra and also of Buddhist Nyāyaśastra. The Buddhists say that Mirok introduced it, but the Hindus cannot say who introduced it.

I reserve the result of my examination of the Nyāyasūtras for the second instalment of this paper; and I conclude this instalment with the remark that though Diṅ-nāga and the Buddhist system of Nyāyaśāstra is almost completely lost in India, so much so, that the discovery of a Tibetan translation of one of Diṅnāga's works, was regarded by scholars as a matter of congratulation, it is still studied and commented upon in China, Japan, Corea, and Mongolia. In Japan only, it has a rival in the European system. But I have been assured that the rivalry has only strengthened the position of the Hindu system. While the colleges study the European system, the monasteries study the ancient system with great zeal.

24. *Notes concerning the People of Mungeli Tahsil, Bilaspore District.* —*By* Rev. E. M. Gordon (*continued from the Journal of the Asiatic Society of Bengal, Vol. LXXIII. Part 3, No. 1, 1904*). [With one plate.] *Communicated by the Anthropological Secretary.*

B. 38. *The Measuring of Grain.*—It is a never-failing practice when a man stops measuring for him to throw a handful of grain back into the measure. On innumerable occasions, for many years, I have seen grain being measured and not once has this act been omitted or forgotten. It is considered lucky for the measure to be never empty. Much the same idea probably underlies the practice of never sweeping out the granary. This would be considered tantamount to sweeping out prosperity.

39. *Sowing Mango Seeds.*—There is a prejudice against the sowing of seeds from mangoes which have been eaten. The fruit of trees grown from such seeds would be considered impure. They would be called *jhuṭṭā*, *i.e*, false or impure. This is an adjective applied to food left over on one's plate after eating.

40. *Respect paid to Cattle which have died.*—I once noticed a few clods of earth placed on the carcass of a cow which was lying on the outskirts of the village. On inquiring as to why those clods were placed there, I was told that the owner of "a beast of burden" or other domesticated animal that has died will with due respect place a few of clods of earth on the carcass and consider that this act has taken the place of a formal burial. The carcass is then taken by the leather workers, who remove the hide, or it is thrown away at a distance to be devoured by vultures.

41. *Granaries causing Dumbness.*—I was once questioning a father regarding his child and remarked that it was late in speaking. His reply was that the child had been placed on a granary, and this was assigned as the reason for the delay in its acquiring the power of speech.

42. *The Cause of prolonged Pregnancy.*—A woman came to the Mission Hospital in Mungeli, and stated that for eleven months she had been pregnant and yet there were no signs of the approach of the expected event. In conversation the doctor learnt that there is a belief amongst the women that if one who is pregnant should step across a string by which a horse is tied, her term of pregnancy will be prolonged and she will take the term required by a mare before delivery. In order to remove the evil consequences of having crossed the rope of a horse, the woman in question must take a quantity of grain in her *sāri* and present the grain to the horse which has affected her. The horse having eaten of the grain she will be relieved of the malign influence.

43. *Wedding the Fields.*—There is a practice in connection with the sowing of fields, which I mention because of the desire of folklorists to have on record every insignificant item which is apparently of no consequence to the layman and yet may be fraught with much meaning to the specialist. After sowing the cold-weather crops, such as wheat, gram, etc., it is customary to

take the plough around the field and sow in a circular form in several rows. This may be for the purpose of covering the ground which had not been sown; but it is interesting to note that the farmers call this final sowing *bihānō*, to wed or marry. Going around the field in a circle may be associated with the circumvention of the marriage pole.

44. *The Milk Woman on the Plough.*—In sowing the cold-weather crops, the plough invariably has a mass of damp earth placed on it at the point where the handle of the plough meets the tongue. This is said to assist the plough to go deep down into the soil. But why should it be called the "milk woman"—the *Rautain?* The farmers are always greatly amused when I ask them why they call the lump of earth the *Rautain;* the term is so familiar to them that they have never asked themselves the question as to where the connection comes in with the "milk woman."

45. *A Possible Explanation of the Preceding.*—Since writing the two preceding notes I have been reading Hiawatha. In the section entitled "Blessing the Cornfields," I find the following lines. These lines are given without note or comment and the reader must judge for himself as to whether there is any connection[1] between the practice they refer to and the practices described in notes 43 and 44.

> " Once when all the maize was planted,
> " Hiawatha wise and thoughtful,
> " Spake and said to Minnehaha,
> " To his wife the Laughing Water.
> " You shall bless to-night the cornfields,
> " Draw a magic circle round them.
> " To protect them from destruction
> " Blast of mildew, blight of insect.
> " In the night when all is silence,
> " In the night, when all is darkness,
> " Rise up from your bed in silence
> " Lay aside your garments wholly
> " Walk around the fields you planted
> " Round the borders of the cornfields
> " Covered by your tresses only.
> " Robed with darkness as a garment
> " From her bed rose Laughing Water.
> " Laid aside her garments wholly,
> " And with darkness clothed and guarde
> " Unashamed and unaffrighted,
> " Drew the sacred magic circle,
> " Of her footprints round the cornfields."

In these lines, then, we find definite reference to a nude woman going around the borders of the cornfields for the purpose of protecting them from injury. In my notes Nos. 43 and 44, it is stated that a plough with a lump of earth called "the milk woman" is taken around the fields several times after they are sown, and this making of a circle around the field is called "wedding the fields." Is there a connection in these two practices?

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[1] [See Frazer, *The Golden Bough*, 2nd ed., vol. II, chap. III.—Ed.]

46. *Binding the Rain.*—Mr. Crooke, in his *Folklore of Northern India*, tells of various devices for binding the rainfall. In this district there is the belief that certain persons have the power to cause the rain to cease. It is said that the merchant when he has stored away large quantities of grain to be sold at a profit, will gather some rain from the eaves of the house in an earthen vessel, and this vessel filled with rain-water he will bury under the grinding mill. The consequence is that from that time forward the thunder will be heard rumbling in the distance like the grinding of a flour-mill, but there will be no more rain. I think it is said that the rain must be gathered from the eaves of a house at the *Pora* Festival.

47. *Counting and keeping Records.*—The method of enumeration followed by the most ignorant people of the district is that of counting by fives. For instance, if a man is counting fruit, he lays aside five which make one *ganda*. Four groups of five make one *kori*, and five groups of *kories* make one hundred. According to Bates' *Hindi Dictionary*, a *ganda* means four, in this district, however, it invariably means five. The great majority of the people in the district cannot count further than ten. The usual way to state high numbers is in *koris* or twenties—160 rupees is eight *kories*, and so on. Intermediate numbers are expressed as follows: 46 = six over two *kories*; 115 = five less six *kories*, and so on. The grain measures most in use are also on the same principle. Twenty *kātās* make one *khandi*, and twenty *khandies* make one *gārā*. When grain is being measured at the threshing floor, the record is kept by making one small pile of grain (a handful in quantity) for every *khandi*. When grain is given out to the labourers from the granary, the record is made on the earthen wall of the granary in cow-dung,—one stroke of the finger dipped in cow-dung means one *kātā*, when twenty strokes have been made they are crossed out and a cipher takes their place and the perpendicular strokes start again from one to twenty.

48. *Some Agricultural Practices*—(1) With regard to the sowing of linseed, there is a belief that if the seed is sown from a woollen blanket and cattle graze in a field grown from seed thus sown, the cattle will surely die. I questioned a farmer in the Damoh District on this point and found that the same belief prevails there also. (2) It is also said that if iron in any shape should come in contact with peas when they are being sown, the seeds will not germinate. An iron or metallic spoon is never used to stir the peas when they are being boiled as *dall*, for the metal will cause the *dall* to be tough and indigestible. (3) When the rice or *kodo* harvest is about to be completed and the reaper comes to cut the last sheaf, he will throw it up into the air and use some of the obscene phrases which are used in the *Holi* Festival. (4) When the grain has been threshed in the threshing

floor and the first load of threshed grain is being carried to the house to be stored, the housewife will come out to meet the labourer who is carrying the load. She has in her hand a *lota* of water, and with this she walks around the man carrying the grain and does obeisance to the grain. This respect is paid to the first load of grain only.

49. *Cause and Cure of Styes.*—There is a wide-spread belief that styes are caused by seeing a dog in the act of defœcating. And there are several remedies employed to remove a stye. One of the most common remedies is connected with the *Dalhan Pahar*, the hill which occupies such a prominent position as a geographical feature of the district. This hill may be seen at a distance of fifty or eighty miles. The peak of the hill seen at a distance just appearing above the horizon has some resemblance to a stye. The belief is that if a person suffering from a stye should face this mountain and say, "*Dalhan Pahar chotā mor sulie barā*" (the Dalhan Hill is small, my stye is big) the hill will be annoyed, the stye will be pleased, and as a result the stye will disppear. Some say that while saying these words, the afflicted person should rub the third finger of the right hand in the palm of the left hand and apply the finger to the stye. It is also customary to take a grain of the wild rice, apply it to the stye, and then throw it away. As the grain decays the stye will disappear.

50. *Saluting at Lamp-light.*—It is customary amongst the Satnamies for the menials and subordinates to salute a superior when the lamp is first lighted at dusk. I was once seated outside a tent with a number of villagers around me, when the servant lighted the lamp and placed it on the table inside the tent. Immediately all the villagers arose and said "*Satnam*" to me and then resumed their seats. Being a stranger to the people at that time, I was completely taken aback; but on inquiry I learned that this is a common practice. Now I have come to look for the salutation under similar circumstances. The entry of the lamp is considered the ushering in of a new period of time, and hence the people "wish you the time."

51. *Concerning Meeting and Entertaining.*—It is an invariable practice when relatives come together who have not met for a long while, for the womenfolk to weep and wail loudly. A son has been away for months and returns to his parents' house. He will first go and touch the feet of his father and mother. When he has been seated, the mother and sisters come to him and each in turn, placing both hands on his shoulders, weeps loudly and in a wailing tone narrates anything special that has taken place in his absence.

To a stranger it would seem that a great loss has befallen them. A daughter would be welcomed in the same way. Frequently I have mistaken the weeping of meeting for that of mourning. Experience, however, has taught me to distinguish the two kinds of wailing. When anyone goes as a guest to a friend's house, he partakes of the usual food prepared by the family. When the people who are entertaining prepare some specially good food, he takes it as a sign that his entertainment has now come to an end, and the next day he takes his departure.

52. *The Spindle and the Panchāyat.*—When a *panchāyat* or meeting of the leading men in a village is in progress, it is considered unwise to have anyone present who is twirling a spindle. It is said that as the spindle keeps revolving, so will the discussion move in a circle and fail to come to a decided issue.

53. *Vermin from the Clouds.*—There is a very prevalent belief that worms, frogs and snakes drop from the clouds. After cloudy weather, when insects appear on certain vegetables, it is said that they have dropped from the clouds. Strange as this idea may seem to us, we have a phrase which is even still more strange, for we sometimes say, "It is raining cats and dogs."

54. *Tattooing.*—This is done by the Gond women who usually travel through the district during the harvest time. The tattooing is not as elaborate as is seen in other parts of India. In fact, it appears to me to be strikingly meagre. The most common figures are those of two deer facing each other, and also the figure of a chain or part of a chain. It is said that if a woman is not tattooed in this world, she will be marked with a *Sabār* or crow-bar by the gods in the next world. A woman will on no account allow her husband to pay for any tattooing she may have done, lest he should say to her when displeased, "I have not only paid for you at our marriage, but I have paid for your tattoo marks as well." Rather than give occasion for this taunt, she will beg of a friend to pay for the tattooting she may have done after leaving her parents' home.

55. *Some Matrimonial Beliefs and Practices.*—(**1**) In the event of a bachelor marrying a widow, he alone goes through the marriage ceremony, for a woman never goes through the marriage ceremony more than once. The bachelor in this case would be wedded to a dagger, and the dagger will take the place of the bride throughout the ceremony. (2) If a couple should have twenty-one children, it is said that they would go through the marriage ceremony together a second time. Or if a couple should live to see a grandchild's grandchild, they will do the same. I was told that a couple in a certain village lived to see their grandchild's grandchild; and my informant claimed to have been present at the marriage ceremony which was performed. I will not vouch for the truthfulness of my informant.

56. *Lippoing.*—When a house is *lippoed*, *i.e.*, the floor plastered with cowdung, it is customary to begin at the doorway and do the plastering inwards. Never is the house *lippoed* outwards except after a death.

57. *Effects of an Eclipse.*—An eclipse, it is said, has a detrimental effect on granaries and on animal life not yet born. In order to avoid the grain in the granary losing its germinating power, a mark is made on the side of the granary with cow-dung. The same means is employed to remove the evil influence from pregnant animals. A mare would have a mark made on the side with *gobur* (cow-dung) and a pregnant woman has a mark made

on her left side. I think it is a circular mark that is made. If this precaution was not taken, the offspring would be deformed. I once met a lad on the roadside with a deformed leg. I afterwards questioned the man who accompanied me as to the probable cause of the deformity. The reply was "*Grahan khich liya*"—The eclipse has drawn it up. His meaning was that shortly before the lad was born, there had been an eclipse, which caused the deformity.

58. *Cause of another deformity.*—There is a firm belief that if one should have a sixth finger, it was caused by his having stolen garlic or *huldi* (turmeric) in the previous incarnation. So firm is this belief that gardeners have no fear of losing these vegetables from their gardens by theft. One who steals would appear in the next world with the mark of theft on his hand.

59. *Toothache, Cause and Cure.*—An insect is said to be boring in the tooth and causes the pain. In order to remove the insect, the patient is given a piece of hollow bamboo and he sits over a slow fire in which some particular leaf is burning. One end of the hollow bamboo is over the smoke rising from the fire, the other end is placed in the mouth as near as possible to the decayed tooth. It is said that the insect comes out of the tooth, falls through the hollow bamboo into the fire, and the toothache ceases. The gum of some of the Indian figs is also used to close the hollow of a decayed tooth.

60. *Anent the Holi Festival.*—Crooke in his *Folklore of Upper India* gives many interesting particulars regrading the *Holi*. I will mention only a few details observed in this locality. A heap of thorns, etc., are stacked about the first of the lunar month of *Phāgun*. This stack is made just outside the village on some open space. As the days go by and the *Holi* festival draws near, the stack of thorns and dried branches increases continually, for the boys keep adding to the heap of fuel day by day. In the centre of the stack of thorns is a high bamboo pole, to which is tied a branch of the castor plant (*Ricinus communis.*) Under the pole which stands in the centre of the *Holi* stack are some *kowries* or pice, and some turmeric. To the top of the pole is tied a sheaf of dried grass or straw. On questioning a gardener as to when he would sow a certain vegetable, he replied he would do so when the *Holi* pole (*dāng*) falls. His meaning was when the *Holi* is burnt. I find this is a common idiom—"When the *Holi* pole falls." The stack is set on fire by the village priest, who presents *hom* at the village shrine, and he is often a Gond or a *Baigā* or one of the "aboriginal tribes." The fire with which the *Holi* is lighted must be obtained from the *chak mak* or flint and steel. No other fire will suffice. Some of the ashes of the *Holi* are kept and supposed to have power in removing evil influences of spirits.

61. *The Burial of Gosais.*—On hearing of the burial of a prominent Gosai, I gathered the following information from some disinterested persons of other castes, who were present at the burial and witnessed the whole ceremony. (1) Immediately after death the body was washed and covered with moist ashes. (2) A

deep whole was dug on the bank of the tank and the body was placed in this hole in a sitting posture with legs crossed as represented in the figures of Buddha. (3) The face was toward the north. (4) The body had a *langoti*, a meagre loin cloth. (5) Another piece of cloth was cut open in the centre and the head was put through this opening in the cloth, so that the cloth rested on the shoulders. It was coloured with a red earthen dye (*geru*). See *Exod.* xxviii. 31,32, R. Version. "Thou shalt make the robe of the ephod all of blue. And it shall have a hole for the head in the midst thereof." (6) Under the shoulder was placed a *jholi* or bag of cloth, the string of which went around the shoulder. (7) The right hand was placed to the mouth and in the hand was a *chappātie* (loaf of unleavened bread) touching the lips. (8) Inside the mouth was an *udrāj* (the sacred bead which mendicants or those of the priestly castes wear around the neck. In the mouth was also a leaf of the *Bael* tree (*Ægle marmelos*). (9) By the side of the body was placed a stick such as mendicants carry and also a *kamandal* or water-vessel made from a gourd. (10) There were placed by the body a pair of wooden sandles. (11) A piece of cloth was tied carelessly around the head, and over this was placed an earthen plate turned upside down. (12) The body was then surrounded with fifteen *katas* of salt (something over a maund.) (13) When the earth had been filled in there was a *Siv* (stone image of of the Linga) placed over the grave, and the fellow-caste-men went around the grave seven times and sprinkled rice on the *Siv*. (14) Every night a lamp is lighted at the grave for one year and a *lota* of water and some rice is sprinkled over the Siv daily. In connection with this burial I should mention that a short distance (five miles) from the village (Heraspore) in which this burial took place, is another village (Dharampurā) which for many decades past has been the residence of Gosais. On the banks of the tank of this village are five different temples. I was told that each of the temples is built over the grave of a man buried as described above. My informant was able to give me the names of four of the Gosais buried there, but he said the name of the man buried under the fifth temple (certainly the oldest and now in a delapidated condition) was unknown to the village people. They had forgotten the name.

62. *Birth Practices.*—Immediately on the delivery of a child the mother has cotton stuffed into her ears. This is said to "keep out the wind." This is also done when one is expiring. There is a belief that a male child comes into the world the face upwards, and the female with the face downwards. It is said that if a male is born face downwards, he will be effeminate, and *vice-versa*. The hair is never allowed to remain knotted during delivery, and if delivery is prolonged and painful, the woman is taken into another house as it is believed the house has something to do with the delay in the child being born.

63. *Sworn Friendships.*—These are known by various names, which are usually connected with the object employed in sealing the friendship. One of the most common names is *Māhāprāsād*,

(the great feast or food). It is supposed to be formed by the convenanting parties partaking together of some of the food cooked and sold at Jugganāth, and brought home by returning pilgrims. As a matter of fact *Māhāprāsād* now means anyone who has sworn to be a life-long friend. These friendships are also formed with the use of Ganges water brought home by pilgrims. In this case the friendship is known as *Gangājal*.

Then, again, any flower may be employed, and the friendship would be termed merely *phul* (flower). This is usually the case amongst women. Each party places a flower in the ear of the other and the friendship is formed. If some particular flower is used that flower gives the name to the friendship. In all these bonds of friendship, it is incumbent on the promising parties to refrain from taking the name of his friend, and they call each other *Māhāprāsād*, *Gangājal*, *Dounā* (*Artemisia vulgaris* or Indian wormwood) or merely *Phul*. It is astonishing how very binding these friendships are considered. After an acquaintance with the people of 14 years I can recall only one instance in which such a friendship was broken. Like David and Jonathan, the parties stand by each other, they are bound together for better or for worse, etc., etc. In has been hinted to me that these friendships sometimes result in a community of possessions extending even to a community of wives. In this connection it is interesting to note what is done when one of the friends happens by forgetfulness or necessity to take the friend's name. He will go to his friend and say, "*Tor douki mor douki, gendā gajlā phul*." These words may have two meanings and have been interpreted both ways to me. They may mean, "Your wife and my wife are a garland of marigold flowers;" or they may mean, "Your wife is my wife, a garland of marigold flowers." By repeating this couplet to his friend it is supposed the offending one makes propitiation for his offence.

64. *Concerning Witches, Fairies, etc.*—(1) There is a belief that witches sometimes have an insatiable desire for human blood, and they can suck blood from the navel of a child without anyone knowing it. As a result the child becomes emaciated and dies. There was once a Telin witch who was possessed by this desire for blood, and not being able to suck the blood from the navel of any other child she was compelled to draw blood from her own infant. If an adult also should suddenly become emaciated and loose flesh, it is said that a witch has sent down a long tongue or tube from the roof of his house when he was asleep and has drawn blood from his navel. In order to regain strength it is necessary to eat a small kind of fish found in the rivers. Also to eat a kind of rice. (2) If a child is believed to be possessed by a witch or an elf, it is customary for the parants to take a bangle and a tassel worn at the end of a plait of hair by women and to tie these articles to a twig of the *Baer* tree (*Jujuba vulgaris*). The *Baer* tree is supposed to be the special residence of witches, or elfs or other invisible beings. (3) According to Bates' *Hindi Dictionary*, the word *Pret*

has several meanings, "a spirit of the dead, a goblin spirit, evil sprite, fiend, etc." Here I find it is commonly used to mean an elf or fairy, not necessarily a being with evil influences. *Pretins* are said to assume the form of women and frequent the bazars. By their superhuman powers they can take away articles from the stalls of tradesmen without being detected. A woman with a crooked nose is suspected of being a *Pretin*. The story is told of a *Raut* (milk-man) who was returning from a bazar when he saw a *Pretin*, most beautiful to look upon, fomenting her child under a *Baer* tree. He persuaded her to go to his house, but he hid her *sāri* in a hollow bamboo. The *Pretin* lived happily with the *Raut* and they had three sons. At the marriage of the eldest son the neighbours asked the mother to dance and amuse them. She refused to do this unless she was given her own *sāri*, which the *Raut* had hidden. Persuaded by his guests the man at last produced the hidden *sāri* from the hollow bamboo. Scarcely had the woman put it on when she became invisible and disappeared, never to return. It is said that the descendants of the three sons of this *Pretin* are still in this district, but no one has ventured to inform me just where they may be found. Students of folklore will recognize in this story the widespread belief that the influence of fairies, giants, etc., lies in some special object, *e.g.*, Samson's strength being in his hair. (4) It is believed that some have the power of placing a *Pretin* in a flute or fiddle, and in this case the instrument will make music of its own accord without any human assistance.

65. *Deserting Houses.*—I have been told that amongst the jungle people of this district if a death should take place, the entire settlement, never very large, moves away to another site, doubtless because of the belief that the deceased will frequent his former abode. Amongst the people of this Tehsil, who live in larger and more settled villages and hamlets, there is an inclination to desert the house in which a death has occurred, and to build another house on another site. Higher up in the grades of civilzation we find a desire to withdraw from the room in which one has died, if not from the belief that it is haunted, then on account of the unpleasant associations. Amongst the people of whom I write, if a house is to be deserted it will be *leepoed*, a lamp lighted, and the residents will withdraw.

66. *Punishment of Witches.*—If I was to tell of all the witch stories which are told amongst the people, these notes would have to swell out to undue proportions. Perhaps I should mention that Chhattisgarh has long had a reputation for witchcraft and similar cults. Sleeman, writing as far back as 1835 in his *Rambles and Recollections*, mentions these parts as having an unfavourable reputation. It is currently reported that in the old days when a witch was found she would be tied to the horns or the legs of a buffalo, and the buffalo was then infuriated till the victim was killed.

67. *A Case of "Possession."*—It was on the night of the 9th of August, 1901, that I had the following experience with a man said

to be possessed by the Devil. At eleven o'clock I was called to the Leper Asylum, of which I am Superintendant, to see a leper named Visahu, who was laid hold of by *Shaitan*. It was a dark, drizzling night and I went to the Asylum lantern in hand. Approaching the gate of the Asylum I heard many loud voices for the lepers were greatly excited, and I could also hear the grinding of teeth from the unfortunate man. This was heard at a distance of fully one hundred yards. On approaching the crowd I found the leper Visahu, a man of medium physique, lying on the ground on his chest struggling violently, while two men were seated on him trying to keep him down. They told me he was making efforts to run away from them, and as the river was not far off they feared he would drown himself. I immediately ordered the men to loosen their hold of him, and I talked with him calmly and firmly and tried to pacify him. Meanwhile I noted the wild meaningless look in his eyes, as though he was terribly frightened. He was trembling, shaking from head to foot, his teeth were grinding, and I was convinced it was not a case of shamming. I concluded he was in a fit of some kind. Ordering the ammonia bottle from the hospital, I led Visahu to his own room, and had his bed put in readiness. As we were about to enter his room, the man broke away from me and rushing through the lepers who had gathered around, he went straight for the gate. I went after him as fast as possible, and the crowd followed me. Visahu ran straight into the grveyard, close by; seeing this the crowd hung back and only two attendants followed me as I ran after the man over the *Chamar* graves. With shod feet and with a lantern we had difficulty in following the man because of the cactus thorns and the ditches full of water. He, however, did not seem to heed these, and ran along bare-footed over the graves and the thorns to the other end of the graveyard where he plunged into a ditch full of water. When we overtook him, he sat quaking and grinding his teeth staring around wildly. I again laid hold of his arm and led him back to the Asylum and seated him in the Chapel. Here I kept him under my gaze, talked with him and poured water between his set teeth. For sometime he gazed at me stolidly, with a vacant look and without blinking; there was no intelligence in his face. In the meantime the ammonia was brought from the hospital. He did not seem affected by it. After about ten minutes in the Chapel, his face changed, he looked around to the others and said, "Why have you brought me here?" He seemed like one waking from sleep. He felt the mud and water on his body and asked why we had thrown water on him. I asked him where he had been; he said, "Nowhere!" He had no recollection of having acted strangely. He then became conscious of the bruise on his knee and the thorns which had become imbedded in his feet. On questioning him I learned that he had been on leave from the Asylum and had returned that morning walking some eight miles. After a night meal, he sat in the corner of his room playing on a long bamboo flute which has a deep monotonous tone. He wife was also in the room. After playing for some time he arose and went to the door to go out. Outside the door he said he saw a figure and exclaimed, "What is this?" Immediately he fell forward, and that is all he could remember. I am positive that this was not a case of shamming. I am also positive that he did not recall what took place, that he had no recollection of what took place from the time I saw him on the ground to the time he "came to himself" in the Chapel I am also certain that he was not under the influence of an intoxicant. This case puzzled me for a long while. I could not bring myself to believe it was a case of demon possession, though everything seemed to support that theory. Since this experience, I have looked into the subject of hypnotism, and I am now of opinion that this so-called "case of possesion" was actually a case of auto-hypnotism. The man playing his flute in a monotonous tone for a long time (probably gazing at the light) brought himself into the hypnotic state when he was susceptible to any outside suggestion. Seeing a shadow, may he not have taken this to be a spirit about to possess him? Then the cries of his neighbours "*Shaitan laga hai*" would still further deepen the impression, or, technically, the "suggestion," until he actually became to himself a man possessed. I have seen persons coming out of the hypnotic state, and the way in which consciousness returned to them reminded me of the way in which the leper came to himself and was first conscious of his bruises. I mention this case with the only explanation which suggests itself to me. Perhaps I should say again that there was no history of the use of intoxicants, and the man who is still in the Asylum (May, 1905) is not addicted to the use of intoxicants. Need I add that all the lepers and all the neighbours were fully convinced that it was *Shaitān* who possessed the man, and the *Shaitān* was supposed to be the spirit of a leper who had died fifteen days before and was buried in the graveyard into which Visahu took us on that memorable night in August.

68. *Pacifying the God.*—I once saw a man leading a black goat. On questioning him I was told that he had a buffalo worth forty rupees which was ill. He was taking the goat to tie near the buffalo. He would feed the goat in the name of the *deo* which possessed the buffalo, and when the buffalo recovered, at the next principal festival, the goat would be slaughtered in the name of the god. Some days later I heard that the buffalo had died, and the man was wishing to sell the goat. Another sacrific, however, proved more fortunate. I had a syce, a Ghassia by caste, who had an only son, who was drowned in the river. As the syce and his wife were getting on in years, they wished to have another son. I recall the time when my syce asked leave that he might sacrifice a pig at some shrine in order to have a son. A year or eighteen months later I was told that Raru, the syce, had a son. This boy is now living, is about ten years of age, and comes to me every Christmas for *Baksheesh*. His father is too old for service. Nothing could convince the father that the son was not given in

answer to his sacrifice. To his parents he is in very truth a Samuel —"asked of God."

69. *Terrors of the Night.*—In common with all primitive peoples, the villagers of this Tehsil are greatly scared by the dark night. It is not the dread which civilized persons have of stepping on a snake or a scorpion, but the darkness to them is frequented by evil spirit and malign influences. Specially after someone has died is this fear apparent. It is completely removed during the moonlight nights and most apparent during the dark wet nights in the rains. On a dark night it is considered unwise to name a person recently deceased; a snake also should not be mentioned. By naming the snake or the deceased they will come near. "Speak of an angel," as the saying goes.

70. *Settling Quarrels.*—The Rauts or herdsmen have a festival in September or October, which I am sure will repay investigation by an expert. I wish to mention one item in this connection. For about a month the Rauts go around dressed up with strings of shells (*kowries*) with leather or metallic shields and *lathies* or wooden swords in the hand. At this time they have what is called *mātār jāgnā*. *Jāgnā* means to awake, but what *Mātār* means I cannot say. The Rauts get together on the site where they usually tie the cattle during the heat of the day, and at this place they have a great feast and a merry time. They are all dressed up as described above, and I am told they eat with their shoes on and their *lathies* in their hands. After this feast they go forth to settle any quarrel which may have arisen with neighbouring Rauts during the past year. The quarrel is settled by the use of *lathies* and not by words, one party throws out the challenge by shouting out words of abuse, the others reply and they engage in a hand-to-hand fight till the people in one party are defeated and take to their heels. The people tell me that these fights still take place, but I have had no positive evidence of this being the case.

71. *Scorpion Stings, Immunity from.*—I know for a fact that there are persons on the Tahsil, who are immune to the sting of the scorpion. A man of my acquaintance will deliberately take up a scorpion holding it by the tail. This is not merely done by courage due to dexterity, for I once saw the scorpion strike him and the only discomfort he experienced was a pain as though the part had been burnt or rubbed with chillies. There is a belief that dark skinned persons are more susceptible to the poison, for they suffer more intensely. It has also been stated that if a woman is stung by a scorpion during pregnancy, her offspring will be immune to the scorpion poison. There are certain persons who have a reputation for removing the pain consequent on the sting of a scorpion, and they go through various mesmeric passes over the part stung; and if the distressed portion be the arm, they profess to gradually bring down the pain to the fingers from which extremity the pain is eliminated.

72. *Concerning a Mushroom.*—There is a dark-coloured rather high-growing mushroom found in the open fields, which is known as *Suri gae ki dhetti*, *i.e.*, the teats of the Suri (wild) cow.

I am told that this mushroom grows over the spot where a cow has given birth to its young. It is an invariable practice for the herdsmen or the ploughmen when they find this mushroom to stick it in the cord round the waist or to put it behind the ear. It seems to serve no practical purpose, and yet people carry it around like a charm. This mushroom is tough and leathery and appears to be quite durable.

73. *The Festival of Stilts.*—During the latter half of the Hindu month of Srāvan is held, what I have termed, the festival of stilts because of the practice amongst the boys and sometimes the young men of making stilts and playing with them for 15 days. Just as soon as the light half of Srāvan comes around, these stilts will be seen. The stilts are made by tieing small pieces of bamboo about a foot in length to a long bamboo six feet long, and the foot is placed not across the step of the stilt, as is usually done by English schoolboys, but the foot is placed lengthways on the step of the stilt, so that the long bamboo is held by the toes of the foot. The stilts are not nailed in any part but are tied with twine; and when the twine is wet it makes a creaking noise rubbing against the bamboo, and this noise made at every step of course adds immensely to the enjoyment of the youngsters. When the fifteen days are over, at the *Porā* festival, the children make some specially dainty cakes, and taking their stilts they all go down in a body to the river or tank. Here the stilts are all stacked together like rifles in a guard-room. Before this stack of stilts the children offer *hom* (incense), sometimes merely burning dried cow-dung Then they untie the foot-pieces from the stilts, and one foot-piece is thrown into the river and the other is either buried in the sand by striking it upright or it is carried to the home and struck in the ground in front of the doorway.

The long pieces of bamboo are also taken home and put in the roof to be kept till the next season. After this festival of stilts, the *Kumhārs* make earthen bullocks, paint them in gay colours and take them round for sale. They also make earthen grinding mills and small vessels to amuse the girls. This time of the year appears to be specially the time of amusement for the little ones.

74. *The Fisherman's Net.*—During the *Dasherah* festival a fisherman goes around with his net and he throws this on to the child of any prominent person. This appears to be a sign of good-luck or prosperity, for the parents of the child reward the fisherman with grain or money. A fisherman once tried to throw his net on my little girl; she was greatly alarmed and would not allow it to be done. The man thought it would be unfortunate to be thus hindered; so he placed his net over me. It is a question whether he was more concerned for his own interests or mine.

75. *Snake-Lore and Snake-Charmers.*—The snake-charmers of the district are called *Gouriyās.* They appear to be few in number and I do not find them named in the Census Report. They reside in a few villages of this Tahsil, engage in agriculture during the rains, and in the dry months they wander away to great distances

with their curious pets, which they exhibit and thus make a precarious living. I have called them snake-charmers, but they do not charm with music. I have yet to see the *Gouriyā* who uses the gourd flute so often seen in other parts of India. They wear the peculiarly twisted narrow turban which is characteristic of the Indian snake-charmer. They have attached to their turbans a few claws of bears or tigers and the talons of hawks or large birds of some kind. The snakes usually carried around are the *Python molurus* and two varieties of the cobrā; one with the spectacles and the other without them. The cobrā with the mark on the head is called the *Domi;* without this mark it is called the *Gouhā*, they are believed to be quite distinct snakes. I learned, in conversation with the men, that they make an agreement with the snake when it is first captured as to how long it will be kept in captivity. Some vow to keep it for six months, others for a year-and-a-half. When the time is up, the snake is given its freedom and another is captured. It would be considered a very great misfortune if a snake should die in captivity. On questioning a man as to how the cobrā came to have the mark on its head, I was told that when *Bhagwān*, the deity, went into Pātāl, (the nether region) he placed his foot on the *Nāg*, and it is the footprint of *Bhagwān* that is seen on the snake to-day. "It shall bruise thy head, etc." *Gen.* iii. 15. The *Python molurus* is considered the most *dharmi* (righteous) of all snakes. The reason is that it will never go out of its way to seek for its prey; it lies quietly till the victim happens to come into its immediate vicinity, and then it will lay hold of it. The *Ptyas mucosus* is locally known as the *Āshariyā*, from the month Āshār, corresponding with June-July. It is so called from the popular belief that it is poisonous only in Ashār. The following interesting story is told concerning this snake. I have heard this tale with many variations and it appears to be widely known: At one time the *Āshariyā* was the only poisonous snake[1] in existence. It found a *raut* (a herdsman) lying on the side of a field where he had fallen asleep while tending his cattle. Near the head of the herdsman lay his bamboo flute, which he often played to while away the time while watching his cattle. Now the *Āshariyā* had often heard the sound of the flute, and was annoyed at hearing the music. Finding the *raut* asleep, he determined to silence him forever. He approached the head of the sleeping man and struck him in the forehead saying, "Now you are silenced, and I will never again be troubled with your music." When the *Āshariyā* had gone away, to his great astonishment he again heard the sound of the herdsman's flute just as before. The flute lay at the head of the dead body in such a position that the wind blowing through it caused it to make music just as when played on by the owner. The *Āshariyā* was much enraged at the thought of his poison not having silenced the *rāut*. He determined to distribute his poison to others, and to increase the possibility of the man being killed by his poison. He therefore gave an invitation to all manner of reptiles to come to a feast which he had prepared. All the reptiles came in great numbers to this feast.

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[1] [*Cf.* the Karin and Patani Malay stories of the python (Mason's *Burma* and Annandale, *Fascic. Malay Anthrop.* I).—Ed.]

While distributing food to the guests the *Āshariyā* mixed with the food a good portion of his own deadly poison, which up to that time he alone had possessed. The cobrā and the scorpions and all other stinging insects received as much poison as was contained in the food of which they partook. Hence the various degrees in the poison of snakes. The *Āshariyā* in consequence had only a little poison left, and so it is poisonous only in the month of *Āshar*. It is said that traders in cattle and those who have to do with the breaking in of cattle keep a piece of the tail of the *Āshariyā* by them. If the tail of this snake is pushed up the nostril of a refractory animal (a bullock or a buffalo) the animal will immediately become manageable and submissive. There is still another snake which holds an important place in the folklore of the district. This is locally known as the "*Murari sāp*." I cannot supply the scientific name, but it belongs to the family of earth-snakes, which burrow underground and come to the surface only occasionally. It is not much more than eight inches in length, thick and of much the same dimension from end to end. On account of the similar appearance of head and tail, it is sometimes said to have two heads. For six months it goes one way, and for six months the other. On being touched this snake has a way of curling around in a circular from. This may account for the name (*murnā* means to twist), and it certainly accounts for the popular belief that it is the greatest enemy of the larger snakes, for it will twist itself around them till they are strangled. But the most common belief with regard to the *Murari* is that it will attach itself to a woman's breast and draw away her milk while she sleeps. The snake, it is said, will place its tail in the child's mouth and thus soothe the child while drawing away the milk for its own nourishment. Women hold this snake in special abhorrence.

While speaking with a man concerning the *Murari*, he told me that only recently he had killed this snake in the house of a neighbour, and he had found a quantity of milk in its maw. On my expressing my doubt he went on to explain that his neighbour's wife had a child which had lost flesh for some time past. The reason given was that the snake was taking the woman's milk while the child was starving. Now that the snake had been destroyed, the child was gaining flesh and improving in health. If a *Murari* is found in the fields, it is taken up on a stick and thrown towards the sun. This is called *suraj dekhānā* (shown the sun). It is thrown high up in the air and is killed as a result of the fall. The snake charmers also informed me that at the *Hariyāli* festival, it is their practice to go out in the fields and burn *hom* (sacrifice) at the roots of the trees or herbs which are employed as antidotes to snake poison. It is at this festival also that they lay in a stock of antidotal herbs for use during the coming year.

76. *A Love Portion called Hāthājori.*—The Gond women who go around the Tehsil in the winter months tattooing and selling herbs and roots with medicinal properties, also have with them a herb known as *hāthājori*, which may be roughly translated *hands*

joined. I have seen this herb or root, and it certainly resembles two hands clasped together. This is said to be a *mohini* and is given by a suitor to a woman whose affections he may wish to win. Dr. Watt's in his ***Economic Products of India*** mentions a vegetable growth of this name and he calls it "Eagle's claw." (See his Dictionary M. 208.) He makes no reference to its being a love-portion, and may be he describes an entirely different herb to that which is sold by the Gond women. I have mentioned the *hāthājori* here because of its connection with the following passage in *The Sacred Tree* (a work by Mrs. J. H. Philpot), page 106. "In the valley of Lanzo in Piedmont, lovers in doubt whether to marry consult the oracle in the form of a herb called *concordia*, the root of which is shaped like two hands each with its five fingers." Jewellers sometimes advertize in their catalogues ladies' brooches, which represent two hands clasped together. Is this merely a convenient emblem of friendship, or is it a survival from herbs which looked like clasped hands which were used as love-portions? Since scarf pins with the horse shoe are a survival of the primitive belief that iron wards off evil spirits, why may not this clasped-hand brooch also claim as ancient an ancestry?

77. *A Marriage Practice.*—Going through a village, I noticed a strange figure made of straw attached to a long bamboo hanging over a house. On inquiring I was told that a marriage had recently taken place in the house, and the figure which drew my attention was that of a deer. I then learned that it is customary after a marriage for the bride and bridegroom and friends to resort to the river or tank and wash off the *huldi* with which the persons of the bride and bridegroom have been covered; and while this is being done there is much fun and joking and teasing. One of the plays at this time is to make a deer of straw and place a bow and arrow made of bamboo in the hands of the bridegroom and not let him go from the river till he has taken good aim and pierced the deer with his arrow. After striking the deer he gives chase to the bride who with her friends runs away to the house, and is there overtaken by the bridegroom and his friends. The deer is hoisted on a high bamboo and hangs over the house for some time.

78. *A Primitive form of Lamp Light.*—The *Croton tiglium* is most commonly found throughout this Tehsil. It is used as a border plant for gardens and groves. The seeds of this shrub form a drastic purgative, and are used for this purpose by the people. But there is still another use made of the seeds. They are strung together by children in long rows, and the lowest seed is set on fire and the seeds burn in succession one after the other very slowly, at the same time giving out quite a deal of light. This play amongst the children may possibly be the remains of a general practice of lighting the houses with the seeds of the croton strung together.

79. *Massage and Branding of Infants.*—It is considered a necessity for the mother to massage her infant daily. The mother sits on the floor with her two legs stretched out together straight in front. The child is placed on its back in her lap, the head resting between the knees and the feet towards the mother. By the side

of the mother is the *Gorsi* or roughly-made earthen pot in which are kept the slowly-burning cowdung cakes. The infant's abdomen is first oiled and then the mother places one hand over the fire and the other over the child's stomach, and thus with rapid movements of the hands massages the child with each hand alternately. Meantime she is singing some soothing lullaby. This fomentation is intended to remove flatulence. But sometimes a much severer process is adopted. The child is said to be attacked with a complaint which is called *Dhābhā*. I am unable to say whether this is merely a severe attack of flatulence or constipation or a specific disease. The stomach of the infant, it is said, becomes swollen and hard. If it be a mild attack of *Dhābhā*, the abdomen is branded with the point of an iron sickle. The sickle is placed in the fire till it is red hot and the point is then applied to the stomach in eight or ten different places. Once when passing through a village at night I heard excrutiating cries from a child; on inquiry I was casually informed that a child was suffering from *Dhābhā* and the parents were having it branded. If the disease assumes a severe form, what is called big *Dhābhā*, then several double-pice are placed in the fire, they are then taken up with pinchers and applied to the surface of the abdomen leaving a burn the size of the face of a pice. I believe fully 99 per cent. of the natives of this Tehsil carry on their person the marks of this infantile branding. Some of them carry the marks for forty and fifty years. May we not ask if this practice of branding infants has not some connection with the widespread belief that changlings and witches are afraid of fire and also of iron. This belief may have originated the practice, which has continued because of the beneficial results due to counter irritation. Adults are also branded on the arms and legs in severe cases of rheumatism or in cases of sprains.

80. *Stone Heaps.*—In certain parts of the Tehsil will be found a great pile of stones. A single heap of stones is called a *Kurihā*, from *Kurhonā* to heap. The people can tell nothing as to the origin of the practice, but they say it is considered fortunate to throw a stone on to the heap in passing and thus add to the accumulation of stones. In 2 *Sam.* xviii 17, with regard to the burial of Absolam, we read that he was thrown into a pit and they "raised over him a very great heap of stones" (Revised Version). In Adam Clark's commentary on the above passage I find the following remarks: "This was the method of burying heroes and even traitors .....The ancient cairns or heaps of stones in different parts of the world are of this kind." In Col. Meadows Taylor's novel *Tara, a Maharatta Tale*, I find the following passage descriptive of the country near Bijapore. "The heap of stones had been formed gradually by travellers who, coming from all sides, took up one from the path, and threw it with a prayer to the local divinity upon the pile. This had been done no doubt for centuries."

81. *Ideas regarding Transmigration.*—Some years ago I was quite intimate with a *Satmāni Chamār*. He was fully eighty years of age. This man had many strange ideas, which, unfortunately, at that time I did not appreciate. With my present acquaintance

with folklore, I would have regarded him a valuable "find." For many years now at the *Divali* festival, a lamp has been burnt at his grave for three nights in succession. This old man claimed to be able to tell just what form any man or animal has assumed in the last life, or incarnation. He said that he had some cattle, who were persons who had died owing him money; and they had returned in this form to pay their debts. He himself claimed to have been a Rajput in the last life, and for some offence he was born a Chamar. He expected on his return to the earth to be born a Brahman. I once took him to see my horse which was tied in the stable. On our entering the stable the horse started. I said to Goburdhan, "Now, can you tell me what this horse was in the last life." He was equal to the occasion, for he replied immediately, "He was a deer and was shot." "How do you know?" I asked. "Did you not notice how he started when we entered," he replied, "he is timid like a deer, and look at this," pointing to a birth-mark on the side of the animal, "this is where a bullet has entered. He was a deer and was shot." It is a common idea amongst the people of this district that marks on the body are transmitted. If a child should be born and should die almost immediately, the expression used is "*bahurgayā*, "It has returned." The idea is that the life came into this world and went back from whence it came.

82. *Observation during a Small-pox Epidemic.*—Early in 1904 there was a small-pox epidemic in the town of Mungeli; and I had ample opportunity of making many interesting observations. The conclusion I came to was, that during the epidemic the people feel that there is some strong personality in their midst, and all their efforts are with the purpose of pleasing this great power or influence or person. As is usually the case, they believe what would please themselves will please this great being or power. The *mātā* or *devi* is supposed to be visiting the family in which there is a case of small-pox. It is not considered a misfortune but rather an honour. The yard of the house in which the patient lies is surrounded by a hedge of thorns or dried twigs. The purpose is to keep away persons whose presence will annoy the goddess and to hinder persons with shod feet approaching the house. Someone is always in attendance on the patient. Every word he may utter is considered the word of the goddess. If the patient requests water, the attendants will say, "The goddess is thirsty," and will bring the coldest, purest water obtainable. In the delirium all the wild sayings of the patient are considered the utterances of the great person in their midst. The behests of this person must be complied with, however difficult and repulsive. If the patient says he wants food from the house of a scavenger, it must be done rather than incur the wrath of the goddess. Once a man walked eight miles to ask for food from my table. The reason was that his daughter had small-pox, and when asked what she wanted, she was understood to say she wanted food from the sahib's house, and the father begged me to give him some. On several occasions the people have come asking for the fruit of the *papiyā* from my

garden, as the *mātā* had asked for this fruit. If the goddess should demand a hen, the hen will be purchased and tied near the bed of the patient. It is said that a hen with reversed feathers is the one most appreciated. During a small-pox epidemic I have known poultry with reversed feathers to sell at an exorbitant price. Sometimes a goat is tied in the house of the patient and daintily fed in the name of the goddess, with a promise that it will be slaughtered in the event of the patient's recovery. Every evening in each house in which there is a small-pox patient, music is heard and songs are sung in praise of the goddess. Musical instruments are also employed, more especially the drum. The friends of the patient will sit up all night. If the patient is in distress, nothing is done to alleviate the suffering; but the friends perplex themselves in trying to find out what they have done to annoy the goddess or what they have omitted to do which will please her. One evening I questioned a young man passing my gate as to where he was going. He replied he was going to join his friends who were to watch by the house of a caste-fellow who had small-pox. On inquiring why he was going to watch, he replied, "In case a dog or a cat should come near the house at night and annoy the goddess." I asked how long the friend had had the sickness. He replied, "Six years." On seeing my perplexity he explained that they say *year for day* in speaking of this illness. I then asked how much longer he expected the friend would be sick. He replied, "Eight or ten years." When the epidemic was abating in the town of Mungeli, the following story was told around and about the town and was believed to be true by all who heard and all who told it. A certain Bania, whose name was given, went from Mungeli to the neighbouring town of Nawagarh; on his return after dark he came upon seven women seated by fires on the roadside. He addressed them as "friends" and asked them for fire to light his *birhi* (pipe). They paid no attention to him, and he noticed their fires had no smoke and that they burned steadily. He then went his way on horseback. His syce or groom came behind him and met these same women. They said to the syce, "Your master addressed us as friends and we have destroyed two of his children. Tell him we have done our work in Mungeli and are now going to Nawagarh." This story was believed to account for the sudden cessation of the disease in Mungeli and its sudden appearance in Nawagarh just at that time. I have been told that when the disease first appears on a person, he is seated on a bed and his feet are bathed with great ceremony. The water in which his feet are washed must be taken from a running stream; and the water must be taken up in a vessel drawn against the current and not in the direction in which the water is flowing. When the sickness has left the patient his entire body is bathed with great ceremony either on a Monday or a Thursday. Several months after the patient has recovered, the people have the ceremony of "*Vidā karo*," that is, "sending away" the goddess, as some visitor, is sent off, with ceremony. Special food is prepared, and the family party all wear new clothes, and with music and procession they all proceed to the river, where food and small articles are thrown into the stream. Those who vowed the gift of hens or goats, go to the temple or shrine of the goddess, and there they will either set free those creatures or will slaughter them and leave the remains to be removed by the sweepers or other low-caste people. It so happened that the *holi* festival came on when the epidemic was in full force. I had expected this festival to be observed with much zest as the harvest had been plentiful. In such years all festivals are observed with much ado. To my surprise the *holi* festival that year received but little attention, and singing and obscene language were guardedly employed. The reason, I learned, was the presence of the *mātā* in their midst. It was considered offensive to the goddess to sing the *holi* songs. Special songs are sung at night to please the goddess, and it will be interesting some time to have these songs recorded and translated and published in this Journal.

83. *Concerning Stone Inplements.*[1]—While conducting a class of young men, I happened to have on my table a copy of the Journal of the Asiatic Society of Bengal. I showed the class illustrations of the stone implements in the Journal. One of the men remarked, "When I was a boy my father had a stone like that one," pointing out one in the illustrations. The youngman said his father called it a "*sarag patar*"—heaven or sky stone. I immediately saw the importance of this name and was positive the young man referred to a stone implement. In widely separated countries the belief prevails that the stone implements are thunderbolts, and here was the name "heaven stone" used by the people in Mungeli. Next morning I made further inquiries, and my syce offered to get me a "*sarag patar*" which was owned by one of his uncles. The uncle turned up in due time bringing with him a bored stone, and I saw immediately that it was undoubtedly a stone implement of former days. The only use for which this stone was now employed was as a remedy for *galwa*, swollen glands, round the neck. The man who owned the stone, said it had come down from father to to son in his family, for generations. Together with this stone the man brought me a piece of stag's horn, which he said had always been with the stone. I now very much regret that I took no interest in the stag's horn and purchased only the bored stone. It did not occur to me that there was any possible connection between the stone and the stag's horn. Some months later I was reading Sir Daniel Wilson's book on *Left-handedness.* On page 49, he shows that in all probability the makers of flint arrows, etc., employed bones or horns, for these were the only impleplements at their service. The fact that a stone and a stag's horn were handed down for generations together would indicate some close connection between the two; and it seems probable that the stag's horn was the implement with which the stone was the bored. After two years of search I have succeeded in getting together only a dozen stones. Some of these have been badly rubbed when they were used medicinally. But we are able to judge of their original shape and form. One or two of the stones are beautifully smooth inside where bored, "as smooth as glass," as a friend remarked.

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[1] See Plate VI.

One stone has undoubtedly been arrested in the process of manufacture. The outward form is complete and it has not been rubbed in any way for medicinal purposes. The hole in the centre, however, is only half bored. This hole was evidently made by striking in some sharp-pointed implement. It certainly does not show signs of the rotatory action of a horn or bone implement. One or two of the stones in my collection were said to have been found in fields near the site of an old village. Others have been heirlooms in families for many generations. One man told me he owned a "heaven stone," but his house was washed away in a flood and the stone disappeared. The people are very reluctant to make known the fact that they own the stones; and they seem very reluctant to part with them.

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25. *A short history of the House of Phagdu, which ruled over Tibet on the decline of Sakya till 1432 A.D.*—*By Rai* SARAT CHANDRA DAS, *Bahadur*, C.I.E.

When in former times the Sakya hierarchs enjoyed the proud privilege of being the spiritual instructors of the Tartar Emperors of China, the envoy Situ Akyid took a census of the households of the agricultural Tibetans and also of the *Hor* Tibetans (so called from their leading a nomadic life like the Mongols). Within the *Thikor* or governorship of Phagmodu in Central Tibet, there were included two thousand four hundred and thirty-eight families, out of which six hundred belonged to Lhasa City, and five hundred to Taglûng. When *Hor* Jam, one of the Tartar Commissioners of China, visited the Chyan̂gkhā (the northern province, including Nom-tsho or lake Tengrī Nor), he included the numerous tribes of herdsmen that dwelt there in the political province of Phagmodu. The Emperor of China, in consultation with the spiritual authorities of Sakya, placed this large division under an able *T'hipon* or provincial governor. Formerly, when both Dikhûng Di-gün̂ and Dansa-thil hierarch amalgamated their temporal and monastic possessions, Gompa Shagrin, the abbot of Dikhûng, with the general consent of the clergy and laity of Tibet got one of his relations, named Gomtson, appointed as *T'hipon* who, under the patronage of the Chiefs of Kang-yeng and lower Mongolia built the government house (*T'hikhang*) of Tshong-du-tāgkhar. Thereafter, Khanpo Ringyal, the Toḷpon of the famous hierarch Chyan-n̂a Rinpoche, became the chief of Lhobrag Shong-de. About this time a native of Kham, named Dorjepal, by his ability, energy and accomplishments, attracted the notice of Chyan-n̂â-Rinpoche. This young man, introducing himself to that Grand Lama as one sprung from the noble family of Dag Lah-zig, and as very anxious to be his disciple, so insinuated himself into his confidence, that the Grand Lama, struck with his general efficiency in all matters of importance, sent him to China to represent the interests of his grand hierarchy. There he took the opportunity of securing for himself and his heirs the governorship of Central Tibet, together with a state seal and decorations. Returning to Tibet in the year *Tree-tiger* (1192 A.D.), he built the *T'hikhang* (government houses) of Yarlûng, called Namgyal-ling and Ñedong-tse. During his rule, which extended over thirteen years, he enjoyed the goodwill both of those who were above and under him. He was renowned for his liberality. His governorship extended over twelve important places, besides Ñedong-tse, which was the chief seat of his government. These were Halayang, Namo, Chag-tse-tugu, Thangpo-chin-ling-me, Choi Slukha, Monkhar, Tashi-dong, Gyathang, Tshong-dui-tag-kha, Zangri-Phodang-gang, Khortog-cha, and Kardo. After his death, his younger brother named Shon-nu Gyal-tshan, discharged the duties of *T'hipon* for three or four years. He was succeeded by one of his relations, named Chyang-shon (born of the family of Kya-ya-dag-chu), during whose administration the Sakya and Dikhung hierarchies fought with each other. Chyang-shon had the good wishes of the Sakyapa authorities, but owing to some cause having incurred the displeasure of Ponchen (chief Governor) Anglen of Sakya, he was ordered to be burnt alive, but on explaining matters he was exonerated and his life spared. After his death the grandson of Shon-nu Gyal-tshan, named Shon-nu Yontan, became *T'hipon.*

At this time Thumer Bukhoi, a Mongol prince of the Imperial family, with his wife, came on a pilgrimage to Tibet. The *T'hipon* having failed to show his efficiency in military as well as in civil matters, and being reported to have oppressed his subjects, the younger brother of Chyan-ña Rin-pochhe, nicknamed Gyaro, or the bearded, recommended his dismissal to the Mongol chief. During this time the State affairs of *T'hikhor* were conducted by a council formed of the following: The governor of Sakya Monastery, named Rin-chen Tashi, Tson-dui Pal, a relation of Chyan-ña-Rin-poche, the second cousin of Shon-nu Yontan, Tagpa-P*h*ozer, the son of Gogochu, named Dorje of Yarlung, Jo*v*o Tagpa Rin, and others. In the meantime, with the sanction of the Emperor of China, Taisri Tagpa-*hod*pa became governor. By bringing Gya*r*o, the brother of Chyan-ña-Rin-poche, over to his side, he also assumed the spiritual power. He gave the ex-governor, Shon-nu Yontan, the villages of Tenpora and Chomonkhar for his personal maintenance. On the death of Gya*r*o, the elder brother of Chyan-ña-Rin-pochhe, named Gyal Shonpal, proceeded to Peking, and with the sanction of Lhaje Phagmodu, (Phag-du heirarch) assumed the office of *t'hipon*. Shortly after, he was deposed by the Sakyapa authorities, who placed his younger brother in charge of the government. From him the office descended to Gyal-tshan Kyab, the son of Shon-nu Gyaltshan.

When Disri Kuntob-pa proceeded to China, Gyal-tshan Kyab was discharged from the governorship. Ritsi Wang Gyalpo then became *t'hipon*, and received the title of Tai Situ. He was succeeded by Sonam Gyal-tshan, the grandson of Gyal-tshan Kyab, who performed the duties of *T'hipon.* He was very popular with his subjects. He was so very resolute that no one could oppose his views or outdo him in anything. He brought all Tibet under his sway. Situ Chyan-tshan, from his early age, became skilful in war, literature, and religion. At the age of fifty-five in the year *Water-monkey*, in the 15th of the second month, he undertook the task of rescuing the Sakya regent, Ponchen Gyal-tshang, who had been kept in durance by the abbot Lhakhong Labrangpa of the great temple of Sakya; and for this purpose he placed himself at the head of the troops of Ü and Tsang and waged war with Sakya. On the 5th of the fifth month of the same year, with the assistance of the minor chiefs, he besieged Sakya and delivered the chief from the hands of his enemies. Before dispersing his army he compelled the heirarch to appoint him as chief *t'hipon* of Tibet, and was supported by his nephew, Situ Lodoi Gyal-tsan, in his works. He was presented with a hexagonal seal, and the people of Tsang distinguished him by raising white silken banners in his honour. He encouraged both literature and religion.

Chyañ-chub Gyal-tshan (the younger brother of Rinchen Tagyal) was born in the year *Tree-tiger* 1302, A.D. In the fourteenth year for his age (*Hare-year*) he took his admission into the monastery of Sakya, where he stayed with the heirarch Dag-nid-chenpo. He was entrusted with the office of keeping the Government seal. Once the Grand Lama asked if he (Chyañ-chub) would go up for the church, so as to be called a Rinpoche, or for the State to be called *t'hipon* or governor. On his wishing to be a Rinpoche, the Grand Lama said, "No, you are destined for the State. In order to qualify yourself for a governorship you should study the work called 'Yul-Jyal' and some works on political ethics." Thereafter, taking leave of the Grand Lama, he became a pupil of Lama Nam-mé-chenpo and learnt the two parts of logic. In the autumn of *Tiger-year* Chyañ-Chub and his elder brother Lopon Tagzang were respectively invested with the temporal and spiritual offices. At the investiture, people were entertained with tea boiled in the same cauldron. Lopon Tagzang expounded the sacred laws and delivered sermons, while Chyañ-Chub assumed the dignity of *T'hipon* or governor.

When Chyañ-Chub became known all over the country, with the help of all other minor *T'hipon*, he besieged Sakya. He occupied Chya-zang-gang, which was then called Cha-zang-kang, and from some good action done in it, it became known by the name of Chyazang Jong (or the place of good action). During his reign the house of Lha-zig became very powerful. Having achieved many exploits in temporal matters, he (Chyan Chhub) resolved upon doing pious actions. He built the monastery of Tse-thang (Chethang) and established a college there. He made Nedong-tse the chief seat of government. Inviting the Grand Lama Sonam Gyal-tshan, he consecrated the religious establishment founded by him and appointed his cousin, Shakya Gyal-tshan, as the head of the church and president of the ceremonies to regulate the order of precedence. Thus the government of Phag-modu, for its efficiency both in temporal and spiritual matters, became very famous, and excelled those preceding it. At the age of 63, in the year *Fire-dragon*, he retired from this existence at the palace of Nedong (Gahdan-tse). His cousin, Cakya Gyal-tshan, succeeded him in the throne of Nedong-tse, and assumed both the spiritual and temporal affairs of the State. By his able administration of the church and the secular laws, he increased the prosperity and peace of Û and Tsang. On account of his being ever thoughtful for the happiness of his subjects, he was praised by all men and called Jan Yang Çakya. The Tartar Emperor, Thugan Themur, conferred on him the title of Changa-kûng. After his death, his younger brother Shakya Rinchen, became chief the *t'hipon* and filled the throne of Nedong-tse. He was very fond of inspecting the works of local officers and inquiring after the condition of his subjects. Once while on tour in Û and Tsang, he stopped at the village of Gya-mo-Shong. Here the house that he and his party occupied, accidently caught fire, which quickly spreading so surrounded him that he and his servants very narrowly escaped from being burnt. On his return he founded the monastery of Khartag Gonsar, and stayed there to avert the calamities that, according to his fortune-tellers, hung over him. He always roved from one place to another. Chyang-tag Chyan presided at the head of the State Church for a few years.

After Çakya Rinchen's death his younger brother, Tagrin, filled the throne of Nedong-tse. For some time the state affairs were in the hands of Gyal-tshan-Zang and his cousin. The control of the government remained with Chyan-ña till Gyal-tshan Zang, also called Tagrin, came in a state hide-boat from Gongkar to relieve him of the charge. He was succeeded by Tagpa Gyal-tshan, a boy of eleven, the son of Çakya Rinchen, in the year *Tree-bird.*

From his boyhood Tagpa Gyal-tshen took to athletic and intellectual exercises. When he advanced in age he began to show his ability and fortitude. Within a few years of his attainment of youth, he established his authority over all the governors of Û and Tsang. The Emperor Tā-Ming bestowed on him the decorations of *Konting Gushri* and *Tshan-ha Wang*, and presented him with a gold seal. He also from time to time received other titles of honour, besides kind instructions from the Emperor himself. Power, fortune, and wisdom were ever attached to him. His reign extended from the 11th to the 59th year of his age. The State under his rule progressed very much in wealth and prosperity. Of all the rulers of the Phagdu dynasty, his reign was the longest. He died at Nedong-tse in the 59th year of his age in the year *Water-mouse.*

From the foundation of Nedong-tse and Namgyal Jong of Yarlung by *T'hipon* Dorjepal in the year *Tree-tiger* to the present year *Tree-tiger* (1432 A.D.) 240 years have elapsed. Nedong-tse was therefore founded in the year 1192 A.D.

Another account of Chyañ-Chub Gyal-tsan and his successors.

In the year 1302 A.D. Chyañ-Chûb Gyal-tshan, of the well known family of Lhazig, was born in the town of Phag-du in Central Tibet. After subjugating all the thirteen (*Thikor*) provinces of Tibet proper and also Kham, he had established his sway over Tibet. At the age of eighteen he was appointed to the command of 10,000 soldiers under orders from the Emperor of China. This sudden elevation excited the jealousy and enmity of the chiefs of Di-guñ, Tshal, Ya*h*zañ and Sakya authorities, who spared no pains in devising means to ruin him. At last, they drove him to war. In the first battle he met with some reverses, but was victorious in the second. The war lasted for many years, when ultimately victory attended the arms of the chief of Phagdu, who captured almost all the hostile chiefs and threw them into prison. After this discomfiture, the chiefs, nobles and Lamas of Û and Tsang jointly petitioned the Emperor to degrade the upstart. But the irrepressible Chief proceeded to Peking; there, presenting the skin of a white lion, besides other rich and rare presents to Emperor Thugwan Thumer, he represented the circumstances connected with the case. Pleased with his sincere statements, the Emperor decided in his favour and appointed him hereditary noble of Tibet, assigning the whole of Û to him with the exception of the province of Tsang which continued to remain under the heirarchy of Sakya.

After his return to Tibet from Peking, Chyañ-Chûb organized a regular form of government for Central Tibet. He reformed legislation, and revised the ancient laws and regulations. He built the castle of Nedoñg-tse and a large fortress with three gates to the ramparts. Inside it he founded a monastery. He endeavoured to observe the *Dasa Çila* (ten moral virtues). By his exemplary morals and pity, and above all by his beneficial rule, he won the sincere esteem of his subjects. He founded the town of Tse-thang with a monastery in it. He built thirteen forts such as Gongkar, Tagkar, &c. Later on, he induced the Tartar Emperor to confer on him the high distinction of Tāi-Situ together with authority over the whole of Tibet. By his able rule he increased the happiness and prosperity of his people.

The fourth in succession from him was Sakya Rinchen,[1] who became a favourite of the Emperor, by whom he was entrusted with the collection of revenue from one of the great provinces of China, and also with the charge of guarding the Imperial palace. Sakya Rinchen, intead of showing his gratefulness, took part in a conspiracy matured by the Chinese prime Minister named Kyen-Hûn, to usurp the throne. He sent many wagons, loaded with armed soldiers, concealed under heaps of silk clothes under cover of darkness inside the imperial city. The Emperor, fortunately, having got scent of the matter secretly fled towards Mongolia. Sakya Rinchen proclaimed the minister's son, Li-Wang, as Emperor of China. Thus through the help of a Tibetan chief the Tā-Ming dynasty was established. Yûng Ming presented Tag-pa Gyal-tshan, son of Sakya Rinchen, with a gold seal and the additional possession of ulterior Tibet. He was made the undisputed sovereign of all Tibet, which extended from Nagahrikor-sum to Sze-chuan. Tag-pa Gyal-tshan was succeeded by his son Wang-Jûng-né, whose appointment was confirmed by the Emperor Kyen Tai Li-Wang. He built the fortresses of Hug-Yûg-ling and Karjong. His grandson, Rin Dorje, obtained the title of Wang (king) from China. Ñag Wang Tashi was a very impartial and just ruler. He shewed great veneration for the Dalai Lama So-nam Gyatsho, whom he greatly patronized. The celebrated Dharma Raja named Padma Karpo of Bhutan was also a friend of his. He several times fought with his rebel minister Rinchenpûñpa and was every time successful. He was decorated with the title of *Kwa-tin Kau Sri* by the Emperor.

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[1] Son of Rinchen Kyab.

During the reign of the Phagdu dynasty all Tibet enjoyed peace and prosperity. People became rich in money and cattle. The country enjoyed immunity from famine and murrain, and was not harassed by foreign invasion. Although, some petty fights and quarrels with some of the disaffected and rapacious ministers now and then disturbed the peace of the country, yet on the whole, the dynasty was beneficial to Tibet.

26. *Additions to the Collection of Oriental Snakes in the Indian Museum, Part 3.* (With 3 figures).—*By* N. Annandale, B.A., D.Sc., *Deputy Superintendent of the Indian Museum.*

The present communication deals with a miscellaneous assemblage of specimens, and completes for the present my notes on recent additions to the collection, all the Oriental species having now being worked out and arranged[1]. Four new species and a new genus are described below, two of the former coming from the Malay Archipelago, one from N. E. India, and one from Gilgit. Considering the number of individuals examined, this does not represent a large percentage of novelties; and although new forms will certainly continue to be discovered from time to time in the remoter districts of the Indian Empire, it is clear that we now have a good general knowledge of the systematic ophiology of the country. The addition of a second species of *Helicops* to the fauna of Asia is interesting, while one of the new Malaysian forms is a good example of superficial resemblance, if not of "Mimicry." A new *Typhlops* and a new *Ablabes* have no particular importance, but must be recorded in order to complete the list.

In regard to doubtful specimens, I have made it a practice to dissect out the jaws on one side. This seems to me to be the only way in which it is possible to ensure a satisfactory view of the dentition. The operation can be performed without materially damaging the specimen externally, and if the bones are preserved in a small tube stoppered with cotton wool in the bottle in which the specimen is kept, they are available for future study.

TYPHLOPIDÆ.

Typhlops mulleri.*

A specimen from the Malay Archipelago is mottled on the dorsal surface of the posterior part of the body with dull yellow, the remainder of the back and sides being brown instead of black; but the latter peculiarity may be due to imperfect preservation.

Typhlops kapaladua,* sp. nov.

Diagnosis.—Habit stout; length about 27 times diameter of body; tail much broader than long, ending in a spine; snout obtuse, the sides rounded, moderately projecting. Rostral between $\frac{1}{3}$ and $\frac{1}{2}$ as broad as head, reaching the level of the eyes behind, separating the nasals completely. Nostril lateral, almost visible from above, with a single large subcircular pit embracing the nasal cleft beneath it; nasal completely divided, the cleft starting from the second labial, not reaching the upper surface of the head. Supraoculars large, frontal and parietal feebly developed. A præocular; no subocular; the former larger than the ocular, in contact with the second and third labials; eye barely distinguishable. Twenty-six scales round body. *Coloration*—Upper surface olive-brown, each scale paler at the edge; upper head scales broadly edged with yellow, a yellow ∩ on the snout and a wedge-shaped mark of the same colour behind each eye; lower half of the rostral and labials and the whole of the lower surface, yellow.

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[1] Since this sentence was written I have obtained some further additions to the collection in the desert tract of S.E. India. They will be described in a later communication to the Society. September 16, 1905.

Total Length.—280 mm.

A single specimen from the Malay Archipelago, probably from Java.

TYPHLOPS ACUTUS.

This species appears to be commoner than any other in Calcutta. It is sometimes found in native houses. I have lately had an opportunity of observing living specimens. When placed in a vessel with earth at the bottom they burrowed very rapidly, provided that the earth was not too hard, forcing their way down by muscular action of the anterior part of the body and making a passage no broader than their own diameter. I failed to see them feed, but have reason to think that they eat the earthworms with which they were supplied, at night. When taken in the hand they coiled round one of the fingers and pressed the tip or side of their hooked and pointed snout against the skin. They could do no injury in this way to the human skin, but seemed rather to be attempting to get a grip. Probably this peculiar modification may be useful in restraining captured worms and it is worthy of note that the caudal spine present in a larger number of the Typhlopidæ is absent both in this form and in several exotic species in which a beak is developed.

GLAUCONIIDÆ.

GLAUCONIA BLANFORDII.

G. blanfordii, *Alcock and Finn, J.A.S.B.*, 1896, (2), p. 561.

In addition to the specimens recorded by Messrs. Alcock and Finn, we have received during the last few years others from Quetta (*Major G. C. Nurse*); Khotri, Sind (*Bombay Nat. Hist. Soc.*), and Bushire, Persia (*Karachi Mus.*). The relative diameter of the body varies considerably, but the number of the scales round it appears to be constant. Well preserved specimens have the upper scales feebly edged with pale-brown.

COLUBRIDÆ.

CALAMARIA LEUCOCEPHALA.*

Two specimens from the Malay Archipelago, one from Java.

DRYOCALAMUS TRISTRIGATUS.*

A small specimen of this rare snake from the Malay Archipelago.

TROPIDONOTUS KHASIENSIS.*

A specimen, probably from Burma, obtained by one of the Museum collectors.

MACROPISTHODON HIMALAYANUS.

Tropidonotus himalayanus, *Boulenger, Faun. Ind., Rept.*, p. 347.

Dissection of the jaws of a specimen lately received from Sureil, Darjeeling, (*Major A. Alcock*) shows that this species belongs to the genus *Macropisthodon.* Fourteen small teeth are followed in the maxillary, after an interspace, by two large, backward-directed fangs. In *T. subminiatus*, the condition is somewhat similar, but the interspace is not so clearly marked. Evidently the separation between the two genera is not a natural one, but the great number of forms included in *Tropidonotus*, in which I would propose to leave *subminiatus*, makes it convenient.

COLUBER RADIATUS.

A specimen from Cuttack, Orissa, (*R. T. Crighton*). I am not aware that the species has hitherto been recorded from this part of India. The late Prof. J. Wood-Mason corresponded with the donor about the specimen, which has been in the Museum for many years; but it appears to have been mislaid at the time when Mr. W. L. Sclater was compiling his *List of Snakes.*

ABLABES BALIODIRUS.*

Specimens from Java and the Malay Archipelago.

ABLABES GILGITICUS,* sp. nov.

Diagnosis.—Habit slender; head small; tail short, ending in a well developed spine.[1] Rostral deeper than broad, visible from above; nasal divided; eye half as long as snout; præfrontal undivided, its length much greater than that of the sutures between the internasals; frontal as long as its distance from the snout, much shorter than the parietals; one præ-and one postocular; loreal large, much longer than deep; temporals 1 + 2; 7 upper labials, third and fourth entering eye; 4 lower labials in contact with the anterior chin shield, which is larger than the posterior. Scales smooth, in 15 rows; ventrals 158; anal entire; caudals 34. *Coloration*—Back and sides dark brown, each scale edged, spotted or blotched with pale yellow; ventral surface paler brown; a broad yellow collar; nape, labials, chin and throat, yellow.

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[1] A similar spine occurs in other members of the genus, notably *A. rappii* but is not so large in any Indian form as in the new species.

Dimensions—

Total Length	... ...	125 mm.
Length of Tail	... ...	18 ,,

A single specimen from Gilgit, collected and presented by Capt. McMahon.

This species may be distinguished from any other Indian *Ablabes* by its extremely short tail. It has much the facies of a *Calamaria*.

HELICOPS INDICUS,* sp. nov.

Head flat, rather viperine; snout obtuse; canthus rostralis well marked. Eye not more than half the length of the frontal; pupil very small. Rostral much broader than deep, well visible from above, separated from the internasal, which is undivided; frontal more than twice as long as broad, obtusely truncated in front, sharply pointed behind, slightly longer than its distance from snout and than the parietals; loreal deeper than long; one præocular, two postoculars; temporals 1 + 2; 7 upper labials, the fourth entering eye; three lower labials in contact with the anterior chin shield, which is shorter than the posterior. Scales smooth, in 21 rows; ventrals 161; anal entire; sub-caudals 72. *Coloration*—dark brown above; on each side of the dorsal surface a pale line originates at the posterior border of the parietal and runs along the body and tail. Ventral surface dull yellow reticulated more or less distinctly with dark brown; a dark spot in the centre of each ventral shield. Labials dull yellow marbled with dark brown.

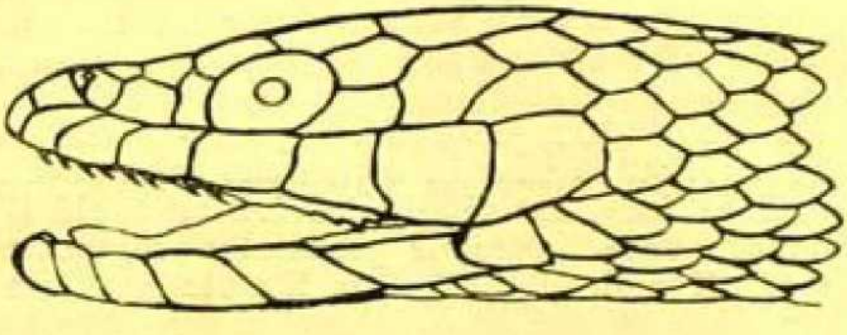

Fig. 1.

Helicops indicus.

Dimensions—

Total Length	... ...	200 mm.
Length of Tail	... ...	40 ,,

Localities—

Monghyr, Bengal, and Rampore Tea Estate, N. Cachar. Two specimens, both purchased.

H. indicus may be distinguished from *H. schistosus*, the only other Asiatic species, by its viper-like head, small eye and smooth scales. As possibly the type specimens are immature, the coloration may be more uniform in the adult than that described.

The following is a "Key" for the two Indian species :—

1. Diameter of the eye more than half the length of the frontal. Scales keeled, in 19 rows ... ... *schistosus.*
2. Diameter of the eye not more than half the length of the frontal. Scales smooth, in 21 rows; nasals in contact behind the rostral ... ... *indicus.*

The distribution of the genus *Helicops* is very interesting Species occur in Tropical Africa; in S. and E. India, Burma, Ceylon, Malaya and Yunnan; in Florida, Central America, the West Indies, and S. America east of the Andes. The similarity between this distribution and that of the Cæcilian genus *Herpele*,[1] which has recently been elucidated by Alcock, is striking. I may point out that one of the types of *Helicops indicus* is from the same locality and collection as that in which the type of *Herpele fulleri* was found. This fact, seemingly trivial in itself, illustrates the improbability of convergence or parallel development being the explanation of all such difficulties in the study of the distribution of animals; for both *Helicops* and *Herpele* are well defined and apparently natural genera, having no peculiarity in common with one another superficially or anatomically.

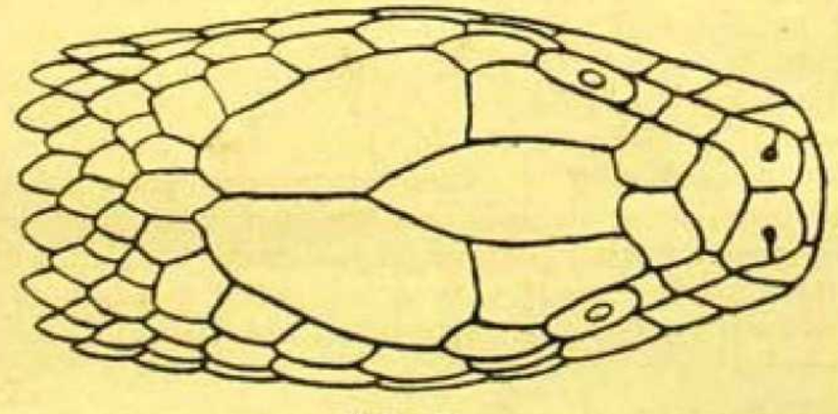

Fig. 2.

Helicops indicus.

DIPSADOIDES, gen. nov.

Family Colubridæ; *sub-family* Dipsadomorphinæ.

Head distinct from body; eye large, with circular pupil; body strongly compressed, with dorsal row of scales enlarged throughout, scales in rows of uneven numbers (19 in type), with apical pits; caudals divided. Palate toothed; solid maxillary teeth few (6 in type), subequal, followed, after a short interspace, by a pair of moderately sized, almost vertical grooved fangs; mandibular teeth subequal.

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[1] *Ann. Mag. N. H.* (xix), 1904, p. 267.

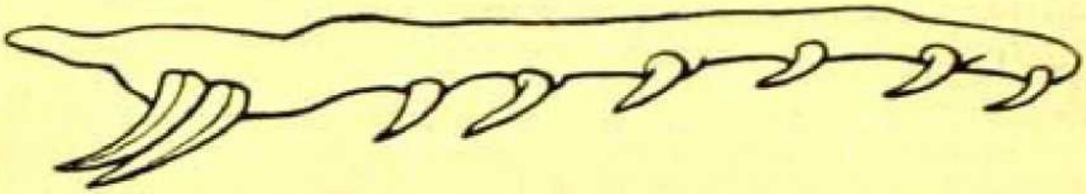


Fig. 3.

Right maxillary of *Dipsadoides decipiens.*

DIPSADOIDES DECIPIENS,* sp. nov.

Head small, flattened, very distinct from neck; snout short, obtusely rounded; eye prominent, nearly as long as snout; nostril large, directed backwards, in undivided nostril. Tail slender, tapering. Rostral broader than deep, just visible from above. Internasals larger than præfrontals; frontal longer than broad, as long as its distance from snout, slightly shorter than parietals; a large præocular and a small postocular; supraocular very large; loreal deeper than long; temporals 2 + 2; eight upper labials, the third, fourth and fifth entering the eye; two large subequal chin shields, the anterior in contact with four labials, both in contact with their neighbours. Body scales narrow, leaf-shaped, slightly oblique on neck, strongly imbricate; in 19 rows; the dorsal row enlarged throughout, broader than long. Ventrals rounded at the edge, keeled at either side, 258 in number; anal entire; caudals 152. *Coloration*—dorsal surface and sides pale brown profusely spotted and marbled with dark brown and, less profusely, with dull yellow; a large number of irregular dark bars on the dorsal surface. Ventral surface dull yellow marbled posteriorly with dark brown; chin and throat spotted with dark brown.

Dimensions—

Total Length ...	... 900 mm.
Length of Tail ...	... 265 ,,

Habitat. Malay Archipelago. A single specimen.

This remarkable snake was confused at first sight with some specimens of *Dipsadomorphus cynodon* in the same collection to which it bore a close external resemblance. It is one of the many interesting species received from the Royal Natural History Society of Batavia.

BUNGARUS SINDANUS*, Blgr.

B. sindanus, *Boulenger, Journ. Bombay N. H. Soc.* XI, 1897-1898, p. 73, pl.

A specimen $64\frac{1}{2}$ inches long has lately been sent to the Museum from the Zoological Garden, Alipore. The Superintendent of the Gardens tells me that it was captured at Midnapore, Lower Bengal, by a reliable collector and arrived at the Gardens early in 1896. It must, therefore, have lived in captivity for nine years. The Giant Krait, as this species may be called, has hitherto been recorded only from Sind, but probably occurs, somewhat sparingly, all over northern India.

27. *Note on the Kantābudiyās of Cuttack.*—*By* JAMINI MOHAN DAS. *Communicated by the Anthropological Secretary.*

The Kantābudiyā caste numbers less than one thousand persons, and is confined to the Cuttack District. The family titles are Khuntiyā, Parirā, Nāyak, Lenkā, Sāhu, Baru, Behārā, Rāut, and Mahānti. Most of these are also titles of the Khandaits and Chāsās, and the Kantābudiyās may have been degraded from one of these castes because they took to the occupation of dealing in tobacco. The members of the caste claim that it is an offshoot of the Khandait caste. They use the same *Santak* or signature mark as the Khandaits—the *Katāri* or dagger. Like the Khandaits, they assume the sacred thread at marriage, but unlike them, they only wear it for eight days and not permanently. They account for their name by a legend that they are the descendants of a foundling who was abandoned near a thorny bush (*Kantābudā*) but tradition does not give any further particulars as to his origin or history. The caste is divided into two totemistic *gotras*, Kacchap and Nāgasa, the members of which revere the tortoise and the cobra respectively. These groups are neither endogamous nor exogamous. There are no endogamous groups within the caste. The exogamous limit is formed by the family title. A Khuntiyā for instance may marry a Parirā but not another Khuntiyā. Similarly, a person may not marry into a family which bears the same title as his maternal grandfather.

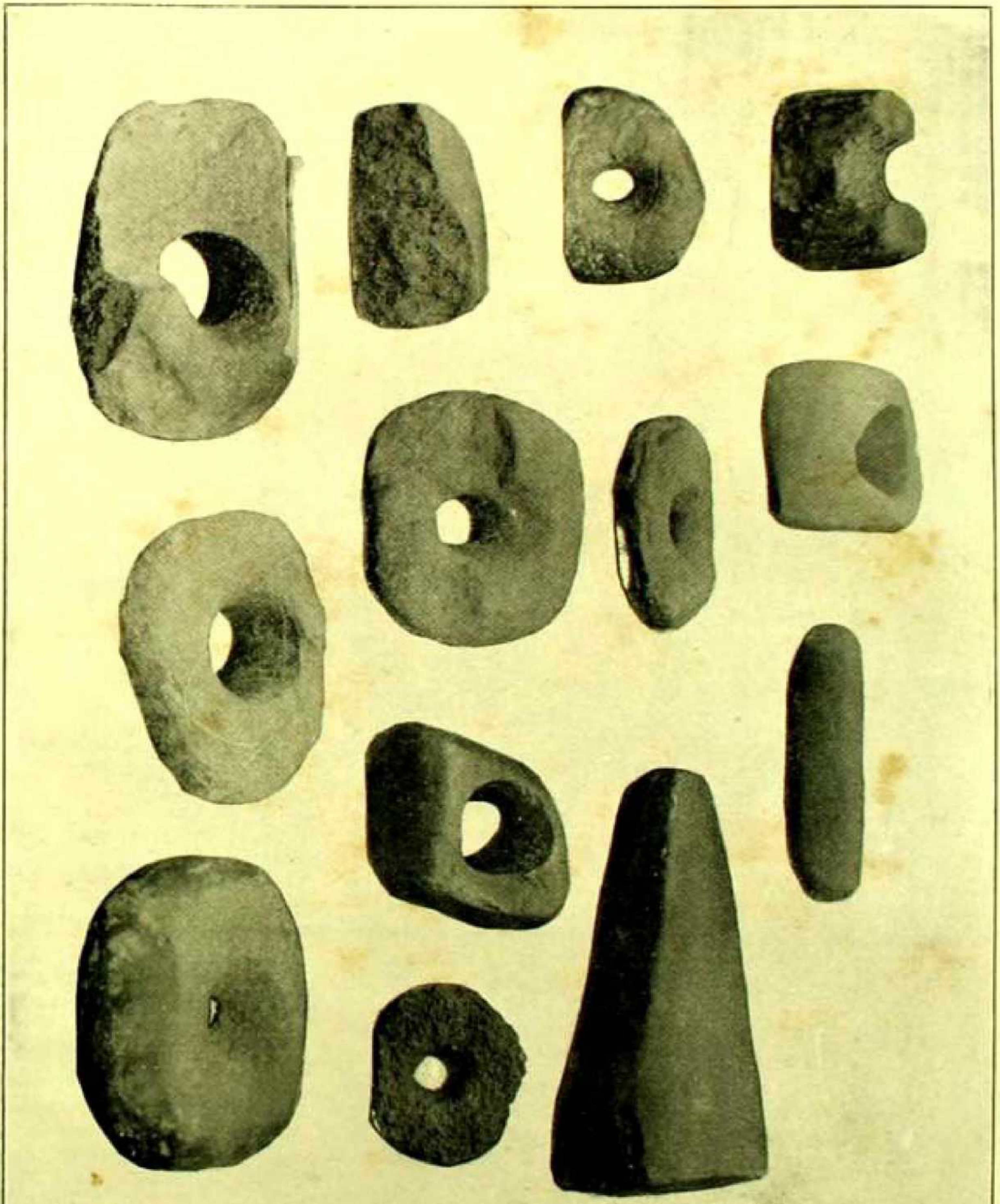
Widow re-marriage is allowed. Divorce is permitted on the ground of unchastity. There is nothing to prevent the re-marriage of a woman who has been divorced, if any one will take her. Polygamy is not practised unless the first wife is barren or suffers from an incurable disease.

The Kantābudiyās belong to the Vaisnava sect. Adhikāri Brāhmans act as their priests, and Brāhman and Karan Vaisnavas as their *gurus*. In all essential respects they follow the marriage customs of the Khandaits and Chāsās.

Persons who die before marriage are buried. Others are buried or burned according to convenience. Mourning continues for ten days and the *Sraddha* is performed on the eleventh day.

The traditional occupation of the caste is dealing in tobacco and turmeric, but about half of the members now combine agriculture with it. There is no organised caste council; meetings of the caste are presided over by the most learned or intelligent member present.

In the matter of food and drink, the Kantābudiyās follow the customs of the Khandaits and Chāsās, who will not, however, take any food from them. The higher castes will not take their water, but they are served by the barber and washerman. The *Gauras*, however, will neither carry their *palkis* nor eat in their houses, and this alone is sufficient to show that they rank lower than the Khandaits and Chāsās. As a consequence of this custom, the Kantābudiyā bridegrooms walk on foot in their marriage processions.



NOVEMBER, 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 1st November 1905, at 9-15 P.M.

The Hon. MR. JUSTICE ASUTOSH MUKHAPADHYAYA, M.A., D.L., F.R.S.E., Vice-President, in the chair.

The following members were present :—

Dr. N Annandale, Mr. I. H. Burkill, Babu Manmohan Chakravarti, Mr. B. L. Chaudhuri, Mr. L. L. Fermor, The Rev. E. Francotte, S.J., Mr. H. G. Graves, Mr. D. Hooper, Mr. T. H. D. La Touche, Mr. J. Macfarlane, Major D. C. Phillott, I.A., Mr. G. E. Pilgrim, Major L. Rogers, I.M.S., Mahamahapadhyaya Haraprasad Shastri, Mr. R. R. Simpson, Pandit Pramatha Nath Tarkabhushan, Pandit Vanamali Vedantatirtha, Pandit Rajendra Nath Vidyābhūṣaṇa Pandit Satis Chandra Vidyābhūṣaṇa.

Visitor :—Mr. G. de P. Cotter.

The minutes of the last meeting were read and confirmed.

One hundred and sixty-eight presentations were announced.

The Chairman announced :—

1. That the Council had appointed Mr. H. E. Stapleton as a member of the Council in the place of Mr. R. O. Lees, resigned.

2. That Dr. N. Annandale having returned to Calcutta had taken over charge of the duties of Anthropological Secretary from Mr. Stapleton.

3. That Mr. L. L. Fermor had been elected to serve on the Library Committee during the year.

The Chairman also announced that in accordance with Rule 38 of the Society's Rules, the names of Mr. R. G. Black, Babu Ramani Mohan Mallick and Babu Jaladhi Chandra Mukerjee had been posted up as defaulting members since the last Meeting and were removed from the Members List.

The Chairman also announced the following resolution of the Council regarding the submission of communications for publication in the Society's "*Journal* and *Proceedings*" and "*Memoirs*."

"The attention of authors is drawn to Rule I of Regulations regarding the submission of communications for publication. No alteration or addition necessitating any considerable change of type may be made in proofs. Should any such alteration or addition be necessary, it must be added in a foot-note duly dated and initialed.

Mr. L. S. O'Malley, I.C.S., proposed by the Hon. Mr. E. A. Gait, seconded by Mr. J. Macfarlane; Mr. A. M. T. Jackson, I.C.S., proposed by the Hon. Mr. H. H. Risley, seconded by Mr. J. Macfarlane; were ballotted for and elected Ordinary Members.

Dr. N. Annandale exhibited living specimens of the "Rains Insect" (*Trombidium grandissimum*).

The Anthropological Secretary exhibited weighing-beams of the "bismer" type from different parts of India.

The following papers were read :—

1. *Vidyāpati Ṭhākur.—By* G. A. GRIERSON, C.I.E., I.C.S.

2. *Some remarks on the Geology of the Gangetic Plain.—By* E. MOLONY, I.C.S.

3. *The Nafāïsu-l-Maāsir.—By* H. BEVERIDGE, I.C.S. (retired).

4. *Notes on the Species, External Characters and Habits of the Dugong.—By* N. ANNANDALE, B.A., D.SC.

5. *Hedyotis sisaparensis, a hitherto undescribed Indian species.—By* CAPTAIN A. T. GAGE, I.M.S.

6. *Result of the examination of the Nyaya Sutras of Gautama.—By* MAHAMAHOPADHYAYA HARAPRASAD SHASTRI, M.A.

The paper will be published in the "*Journal* and *Proceedings*," Vol. I, No. 10.

7. *Materials for a Flora of the Malayan Peninsula. No. 18.—By* SIR GEORGE KING, K.C.I.E., LL.D., F.R.S., and J. S. GAMBLE, ESQ., C.I.E., M.A., F.R.S.

(Abstract.)

Owing to an unforeseen cause of delay, it has been found necessary to postpone the publication of the Natural Orders No 75 *Apocynaceæ*, No. 76 *Asclepiadaceæ* and No. 77 *Loganiaceæ* for a short while; consequently the present part, No. 18 of the "Materials for a Flora of the Malayan Peninsula," contains the orders which succeed, *viz.*, No. 79 *Hydrophyllaceæ* to No. 85 *Lentibulariaceæ* inclusive, together with No. 87 *Bignoniaceæ* and 88 *Pedalinceæ*. No. 78 *Gentienaceæ* has already appeared in part 17, and No. 86 *Gesneraceæ* will have to come later on with the three orders above mentioned as having had to be postponed.

The whole of the work or six out of the nine orders now presented : *Convolvulaceæ, Solanaceæ, Scrophularineæ, Orobanchaceæ, Lentibulariaceæ*, and *Pedalineæ* has been done by Lieutenant-Colonel Prain, I.M.S.; that on the *Boragineæ* by Sir G. King; and that on *Hydrophyllaceæ* and *Bignoniaceæ* by Mr. Gamble.

The nine orders include 53 genera and 150 species; some of the species are now described for the first time.

The paper will be published in full in an Extra No. of the "*Journal* and *Proceedings*" for 1905.

8. *Some notes on dates of Subandhee and Dingnag.—By* MAHAMAHOPADHYAYA HARAPRASAD SHASTRI, M.A.

The paper will be published in the "*Journal* and *Proceedings*," Vol. I, No. 10.

28. *Dignāga and his Pramāṇa-samuccaya.*—*By* Satis Chandra Vidyābhūṣaṇa, M.A.

Distinction between ancient Nyāya and modern Nyāya.

Hindu philosophy is divided into six principal systems of which the Nyāya is one. This Nyāya again is divided into two schools called respectively the ancient Nyāya and modern Nyāya. The distinction between the two schools is this: the ancient Nyāya treats of atoms, properties of atoms, souls, the transmigration of the soul, mind, God, etc., as well as of processes of perception, inferences, and the like, while the modern Nyāya deals only with the methods of perception, inference, etc. The object of the ancient Nyāya is to explain the means of salvation, while that of the modern Nyāya is to give an exposition of the fundamental principles of reasoning. This shows that the ancient Nyāya is a mixture of physics, metaphysics, theology, logic, etc., while the modern Nyāya is exactly identical with what we understand by the term logic.

Buddhistic origin of the modern Nyāya

As this modern Nyāya is the most favourite and honoured subject of study in the Sanskrit *tols* (academies) of Bengal, it is worth while to trace its origin. There can be no doubt as to the modern Nyāya having been developed from the ancient Nyāya, but nothing can be definitely stated as to how and when it was so developed. The first extant work on ancient Nyāya is undoubtedly Gotama's Nyāya Sūtra dated about 500 B.C., but we do not know definitely what was the first work on modern Nyāya.

It was for a long time the universal belief of the Paṇḍits of our country that the Pramāṇa-cintāmaṇi, compiled by Gaṅgeśa Upādhyāya of Mithilā in the 14th century A.D., was the oldest work on modern Nyāya. But this belief of the Paṇḍits was shaken nearly sixteen years ago by Professor Peterson, who published under the auspices of the Asiatic Society of Bengal a Buddhist Sanskrit work on modern Nyāya, called Nyāyabindu, by Dharmakīrti. This work, which was dated the 7th century A.D., at once showed that Gaṅgeśa Upādhyāya's Pramāṇa-cintāmaṇi could not have been the first work on modern Nyāya. Recently another revolution has been caused in our theories by the literary collection of the late Tibet Mission. The Mission has brought from Gyantse the Tibetan version of another Buddhist Sanskrit work on modern Nyāya, called Pramāṇa-samuccaya, compiled by the Buddhist logician Dignāga who flourished long before Dharmakīrti. The Sanskrit original of this work is not available in India or Nepal and has perhaps been lost. But the Tibetan version and numerous authoritative commentaries on the same show in unmistakable terms that this work is the earliest at present known work on modern Nyāya.

In Tibetan there are numerous treatises on logic by various Indian Buddhist authors. These treatises are contained in the Tangyur, section Mdo, volumes 95-116. There the first work on logic is Pramāṇasamuccaya by Dignāga. The next work is Pramāṇa-vārtika-kārikā (or a commentary in verse on the above). Then follows Pramāṇa-vārtikālaṅkāra, and so on. Jinendrabodhi's excellent commentary on the Pramāṇa-samuccaya, called Viśālāmalavati-nāma-Pramāṇa-samuccaya-ṭikā,[1] is also to be found there. Nyāyabindu, Pramāṇa-viniścaya and other excellent Buddhist works on logic are also preserved there. The Tangyur, containing all these works, has been brought from Gyantse by the Tibet Mission, and is now deposited in the British Museum, London. Nearly eighty years ago another set of the Tangyur was brought from Tibet by the late Mr. B. H. Hodgson. That set is now contained in the library of the India Office, London. These excellent and old works on logic lead us to conclude that the credit of having founded the modern Nyāya must be attributed to the Buddhists, among whom there were numerous logicians such as Dignāga, Dharmakīrti, Dharmottara, Vinītadeva, Śāntabhadra, Akalaṅkadeva, Jinendrabodhi, Kamalaśīla and others. These Buddhist writers had flourished long before the Brāhmaṇic logician Gaṅgeśa Upādhyāya compiled his Pramāṇa-cintāmaṇi.

The circumstance which led the Buddhists to forsake the ancient Nyāya and to lay the foundation of a new system called modern Nyāya was due to the peculiarity of the religion which they professed. Having considered the sixteen categories treated in the ancient Nyāya to be redundant and some of them as mainly based on the orthodox principles of the Hindus, the Buddhists took up only one category, *viz.*, *Pramāṇa* (evidence of knowledge), and treated it in such a way that the doctrine of evidence might be equally applied to the religious systems of the Hindus and Buddhists. The attempt on the part of the Buddhists to divest the principles of logic from those of theology, metaphysics, etc., was the cause of the foundation of the modern Nyāya, otherwise called Tarka-śāstra or Logic proper.

Life of Dignāga.

As Pramāṇa-samuccaya (Tibetan: ཚད་མ་ཀུན་བཏུས་) is the earliest-known work on the Buddhist Nyāya, a short account[2] of its author may be of some interest to the reader. Dignāga (Tib. Phyogs-glań ཕྱོགས་གླང་) the celebrated author of this work, was born in a Brāhman family in the south near the country of Kāñci bordering on the city of Siṃhavakta, and acquired vast knowledge in all Tīrtha systems. By Nāgadatta the Paṇḍit of the Vātsīputrīya school he was admitted to the religious system of that school and attained erudition in the Tripiṭaka of the S'rāvaka. Afterwards he became a disciple of Ācāryya Vasubandhu, with whom he studied all the Piṭakas of the Mahâyāna and Hīnayāna. When he had specially obtained incantation formula from a mantra-knowing Ācāryya and practised sorcery, he saw the face of Mañjuśrī and learned the *dharma* (Law) from him. He resided in a solitary and woody country in the land of Orissa in a cavern of a mountain called Bhoraśila, and gave himself entirely up to contemplation

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[1] This work (together with the Tibetan version of the Nyāya-bindu-ṭikā, Candra-vyākarṇa and Tārā stotra) has been kindly lent to me for six months by the Government of India.

[2] *Vide* དཔག་བསམ་ལྗོན་བཟང་ Pag-sam-jon-zang (pages 100-101), edited by Rai Sarat Chandra Das, Bahadur, C.I.E., and Lama Tārānātha's *Buddhism*, Schiefner, pp. 130–135.

A few years later he was invited at Nālanda, where he defeated the Brāhman Sudurjaya and other Tīrtha dialecticians and led them into the doctrine of Buddha He expounded many Sūtras to the religious body, spread the Abhidharma, and composed several logical and dialectical S'āstras. He is said to have composed one hundred śāstras in all. Returning to Orissa he busied himself with contemplation. Seeing that the S'āstras on Dialectics, composed earlier by him, remained scattered about, he resolved to collect them. Accordingly, putting together fragments from particular works, he engaged himself in compiling the Pramāṇasamuccaya (Tib. Tshad-mahi-mdo-kun-las-btus-pa, or simply, Tshad-ma-kun-btus) in which at the opening lines he pays obeisance to Buddha :—

Complilation of Pramāṇa-samuccaya

ཚད་མར་གྱུར་པ་འགྲོ་ལ་ཕན་བྱེད་པ།
སྟོན་པ་བདེ་གཤེགས་སྐྱོབ་ལ་ཕྱག་འཚལ་ནས།

"Having bowed down before Him who is Logic incarnate, the benefactor of all creatures, the teacher, Sugata and the protector."...

While he was writing the opening lines the earth trembled and all the places were filled with light and a great tumult was audible. A Brāhman named Īśvara Kṛṣṇa,[1] surprised at this wonder, came to Ācāryya Dignāga, and, finding that he had gone out to collect alms, wiped out the words he had written. When in this manner he had wiped them out twice, Dignāga wrote them a third time and added—" Let no one wipe this out even in jest and sport, for none should wipe out what is of great importance ; if the sense is not right and one wishes to dispute on that account, let one appear before me in person." When, after he had gone to collect alms, the Brāhman came to wipe out the writings and saw what was added, he waited. When the Ācāryya had returned they began controversy, either staking his own doctrine. When he had vanquished the Tīrtha several times and challenged him to accept the Buddhist doctrine, the Tīrtha scattered ashes, pronounced incantation formula on them and burnt all the goods of the Ācāryya;

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[1] Kṛṣṇ-Iśvara, or simply Kṛṣṇa, seems to be the same as Isvara Kṛṣṇa, the celebrated author of Sāṃkhya-Kārikā, which was translated into Chinese by Paramārtha, A.D. 557–569, noticed in Nanjio's Catalogue, No. 1300. The Tibetan name is ནག་པོ་ཞབ་ཕྱུག = Kṛṣṇa-'Iśvara.

and when the Ācāryya was kept back by the conflagration the Tīrtha went away. Thereupon Dignāga reflected that when he could not work the salvation of this single individual he would not be able to work that of others, and was on the point of giving up his purpose (of compiling Pramāṇa-samuccaya). Āryya Mañjuśrī appeared to him in person and said:—

བུ་མ་བྱེད་མ་བྱེད་སྐྱེ་བོ་དམན་དང་འཕྲད་ལས་བློ་གྲོས་ངན་སྐྱེ་སྟེ།
ཁྱོད་ཀྱི་བསྟན་ནས་འཆོས་འདི་ལ་མུ་སྟེགས་ཚོགས་ཀྱིས་གནོད་མི་ནུས་པར་ཤེས།

ཁྱོད་ཀྱིས་ས་མ་ཐོབ་ཀྱི་བར་དུ་དགེ་བའི་བཤེས་སུ་ང་འགྱུར་གྱི།
ཕྱི་མའི་དུས་སུ་བསྟན་བཅོས་ཀུན་གྱི་མིག་གཅིག་ཏུ་ནི་འདི་འགྱུར་རོ།།

"Son, don't do so, don't do so: owing to contact with a low person there has arisen a bad thought in thee: know that the Tīrtha crowd cannot harm this S'āstra of thine: since I shall remain thy spiritual adviser until thou attainest perfection, this S'āstra will henceforth become the sole eye of all the S'āstras."

The Ācāryya asked:—

བཟོད་ཀའི་སྡུག་བསྔལ་དུ་མ་དང་ལྷན་བརྟག་དཀའ་ལ།
སེམས་ཀྱང་དམ་པ་མིན་པའི་སྤྱོད་པ་ལ་དགའ་ཞིང་།
སྐྱེ་བོ་དམ་པ་འཕྲད་དཀའ་གལ་ཏེ་ཁྱོད་ཀྱི་ཞལ་མཐོང་ཡང་།
བདག་ལ་བྱིན་གྱིས་མ་བརླབས་དེ་ལ་ཅི་བགྱིད་མཆི།

"If I am to suffer many unbearable misfortunes and have to rejoice in the practice of an ignoble being, and if it is difficult to meet with a noble one, what profits it to me to see thy countenance if thou dost not bless me?"

Mañjuśrī replied, "Trouble thyself not. I will protect thee from all terrors," and disappeared. Thereupon Dignāga completed the S'āstra.

Supernatural powers of Dignāga.

Once he was slightly ill and obtained alms from the city; and having fallen asleep while staying in a forest he dreamed a dream. In that dream he saw the face of many Buddhas and attained many *samādhis.* He saw many gods pouring rain of flowers, and the flowers of the wood coming together before him and the elephants affording him cool shade. The king of the country, who had gone for a pleasure excursion with a troop, saw him and, full of admiration, he caused him to be awakened from sleep by the notes of music. Being asked whether he was Dignāga, he replied in the affirmative, and the king fell at his feet. Subsequently he travelled to the south, chiefly meeting his Tīrtha controversalists in discussions.

He restored, for the most part, the schools of religion founded by the former Ācāryyas. Again, at Orissa, he converted to Buddhism Bhadrapālita, the treasury minister of the king. This Brāhman founded sixteen vihāras and placed religious men in them. As a proof of the perfect purity of his character, the stem of a Myrobalan tree, called Muṣṭiharītakī, which cured all diseases and which was to be found in the garden of this Brāhman, having been entirely withered, revived in seven days after the Ācāryya had uttered an incantation for its restoration.

Since he had refuted chiefly the Tīrtha controversalists, he was called the "Fighting Bull" (Sanskrit: *Tarkapuṅgava*; Tibetan: རྩོད་པའི་ཁྱུ་མཆོག་) His pupils, combined together by religion, filled all countries, but he had not with him a single *Śrāmaṇera* who could succeed him. Since he was a man of limited desires and contentment, he performed during his life-time the twelve tested virtues and died in a solitary wood of Orissa.

Jina identified with Dignāga.

In the works of the Chinese pilgrims the name Dignāga is not mentioned at all. But there occurs the name Jina, which I suppose to be identical with Dignāga. Dignāga in the Brāhmanic works, especially in those of Udyotakara and Vācaspati Miśra, is designated as a Bhadanta. Similarly Jina in Chinese books, specially in those of I-tsing, is mentioned as one of the ten Bhadantas (*vide* I-tsing's *Takakusu*, p. 181). As Dignāga in Sanskrit and Tibetan books is known as an eminent logician, so is Jina in Chinese books. Thus I-tsing observes (*Takakusu*, p. 184):—"When they have understood the arguments of Hetuvidyā (logic), they aspire to be like Jina (the great reformer of logic). I-tsing continues (*Takakusu*, p. 188):—"When a priest wishes to distinguish himself in the study of logic he should thoroughly understand Jina's eight S'āstras." These, according to I-tsing, are:—

1. The S'āstra on the Meditation of the Three Worlds (not found).
2. Sarva-lakṣaṇa-dhyāna-śāstra (kārikā)—(Nanjio's Catalogue, No. 1229).
3. The S'āstra on the Meditation on the Object. Probably Ālambana-pratyaya-dhyāna-śāstra (Nanjio's Catalogue, No. 1173).
4. The S'āstra on the Gate of the Cause (Hetu-dvāra)—(not found).
5. The S'astra on the Gate of the Resembling Cause (not found).
6. The Nyāya-dvāra (tāraka) S'āstra (by Nāgārjuna ?)—(Nanjio's Catalogue, Nos. 1223, 1224).

7. Prajñapti-hetu-saṅgraha (?) S'āstra—(Nanjio's Catalogue, No. 1228).
8. The S'āstra on the grouped inferences (not found).

The seventh book, called Prajñapti-hetu-saṅgraha, compiled by Jina, seems to be identical with Pramāṇa-samuccaya which, besides ninety-nine other works, was compiled by Dignāga.

According to I-tsing (*Takakusu*, p. 182) Dharmakīrti made a further improvement in logic after Jina. From Indian sources too (such as from Nyāya-bindu) we know that Dharmakīrti was a distinguished successor of Dignāga and a commentator on his works (*vide* K. B. Pathaka's article on the authorship of Nyāyabindu in the Journal of the Bombay Branch of the Royal Asiatic Society, 1895, Vol. XIX, No. LI, pp. 47–57; also G. A. Jacob's Note on the authorship of Nyāya-bindu in the London Royal Asiatic Society's Journal, April 1905, pp. 361—362).

Hwen-thsang (*vide* Beal's *Buddhistic Record of the Western World*) mentions Jina as having been born in the country of Andhra in the south. We have already seen that Dignāga was born near the country of Kāñcī in the south, probably in the dominion of the Andhras.

The facts stated above go to show that Dignāga and Jina were the same person. As a matter of fact Jina seems to be only a Chinese phonetic equivalent for Dignāga.

Different names of Dignāga.

So it appears that *Dignāga* (Tibetan: phyogs̱-glaṅ) was variously named as *Jina* (victor) *Bhadanta*[1] (a venerable monk) and Ācāryya (as in Nyāyabindu, the Tibetan equivalent being S̱lob-ḏpon). He was also called *Mahādignāgārjuna* (*vide* Eitel's *Dictionary of Chinese Buddhism*), and is thus often mistaken for Nāgārjuna. This explains the fact that Nyāya-dvāra-tāraka-śāstra, really composed by Dignāga, has been attributed to Nāgārjuna. Dignāga also bore the title of *Tarkapuṅgava* (a fighting bull); while his Brāhmanic opponents gave him the title of *Ku-tārkika* (a quibbler).

Brāhmanic references to Dignāga.

Besides the allusion to Dignāga in Kālidāsa's Meghadūta[2] we come across several of his actual views criticised by such eminent authorities as Udyotakara, Vācaspati Miśra and others.

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[1] The word **Bhadanta** in the vocative case assumes the forms *Bhaddanta* and *Bhante*. Compare **भदन्तस्स भद्दन्त भन्ते** (२-४-२५) Kāccāyana, p. 141, edited by **Satis Chandra** Vidyābhūṣaṇa,). A junior monk should address a senior monk by calling him *Bhante* or Āyasmā. So Buddha says:—**नवतरेन भिक्खुना थेरतरो भिक्खु भन्तेति वा आयस्माति वा समुदाचरितब्बो** (Mahāparinibbānasuttta, Bhāṇavāra, 6)

[2] अद्रेः शृङ्गं हरति पवनः किंस्विदित्युन्मुखीभिः
दृष्टोत्साहश्चकितचकितं मुग्धसिद्धाङ्गनाभिः ।

Udyotakara in his Nyāya-vārtika[1] mentions Dignāga under the name of Bhadanta, and describes him as a *Ku-tārkika.* Vācaspati Miśra, in his Tātparyaṭīkā[2] on the Nyāyavārtika has identified Bhadanta with Dignāga, has mentioned Dignāga by name and has tried to justify his appellation *Ku-tārkika.* Dignāga's definition of *Pratyakṣa* (perception) has been mentioned by Udyotakara and Vācaspati Miśra[3] thus:—**प्रत्यक्षं कल्पनापोढम् ।** "Perception is (intuitive and therefore) exempt from reflection."[4]

स्थानादस्मात्सरसनिचुलादुत्पतोदङ्मुखः खं
दिङ्नागानां पथि परिहरन् स्थूलहस्तावलेपान् ॥
(मेघदूतम्, पूर्व्वमेघः, १४) ॥

The commentator Mallinātha says that *Dignāga* referred to in this verse was the Buddhist philosopher of that name.

यदक्षपादः प्रवरो मुनीनां
शमाय शास्त्रं जगतो जगाद ।
कुतार्किकाज्ञाननिवृत्तिहेतुः
करिष्यते तस्य मया निबन्धः ॥ (न्यायवार्त्तिक, पृः १,

edited by Vindhyeśvarī Prasāda Dube, in Bibliotheca Indica series).

[2] यद्यपि भाष्यकृता कृतव्युत्पादनमेतत् तथापि दिङ्नागप्रभृतिभिरर्वाचीनैः कुहेतुसन्तमस-समुत्थापनेन आच्छादितं शास्त्रं न तत्त्वनिर्णयाय पर्य्याप्तमित्युद्द्योतकरेण सनिबन्धोद्द्योतेन तदपनीयते इति प्रयोजनवानयमारम्भ इति । P.1, Nyāyavārtika-tātparyyaṭikā, edited by Gangādhar Śástri

अपरे तु मन्यन्ते प्रत्यक्षं कल्पनापोढमिति । अथ केयं कल्पना नाम जातियोजनेति । यत् किल न नाम्ना अभिधीयते न च जात्यादिभिर्व्यपदिश्यते विषयस्वरूपानुविधायि परिच्छेदकमात्मसंवेद्यं तत् प्रत्यक्षमिति । ... अथास्य वाक्यस्य कोऽर्थो यदि प्रत्यक्षं व्याघातः कथं प्रत्यक्षं कल्पनापोढमिति चानेन वाक्येन अभिधीयते न चाभिधेयमिति कोऽन्यो भदन्ताद् वक्तुमर्हति ।

(न्यायवार्त्तिक, १-१-४, पृः ४३-४४) ॥

नहि यथा सम्यग्ज्ञानमधिकृत्य प्रत्यक्षादिलक्षणं कृतं कीर्त्तिना तथा दिङ्नागेन येनाधिकाराज् ज्ञाने व्यवतिष्ठेत कल्पनापोढमिति भावः न्यायवार्त्तिकतात्पर्य्यटीका, १-१-४, पृः १०२) ।

[4] The same definition of *Pratyakṣa* (perception) occurs in Dignāga's Pramāṇasamuccaya. Compare the Tibetan version of the Pramāṇasamuccaya in the Tangyur, section Mdo, volume XCV, fol. 2a, quoted by Prof. De La

Regarding *anumāna* (inference)[1] Dignāga, according to Udyotakara and Vācaspati, says:—By seeing smoke, we do not, as it has been usually asserted, infer two things—*viz.*, (1) fire, and (2) the connection between fire and the place which is the abode of fire; but we infer only one thing—*viz.*, the place as containing the fire.

Udyotakara and Vācaspati further inform us that Dignāga did not accept *upamāna* (comparison)[2] and *āptavacana* (testi-

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Vallee-Poussin in the Museon; *vide* Prof. Poussin's Extrait du Museon, p. 53. The definition runs as follows:—མངོན་སུམ་རྟོག་པ་དང་བྲལ་བ།

[1] किं पुनः अनेन धूमेन प्रतिपद्यत इति किमग्निम् उत देशम् उत सत्ता उताग्निमन्तं देशम्। .... अग्निमान् देश इति चेत् न धूमस्य अतद्धर्म्मत्वात् ...... (न्यायवार्त्तिक, १-१-५, पृः ५२)।

अत्र दिङ्नागेन धूमादग्निरूपधर्म्मान्तरानुमानम् अग्निदेशयोः सम्बन्धानुमानं च दूषयित्वा अग्निविशिष्टदेशानुमानं समर्थितम् तथा चाह।

केचिद् धर्म्मान्तरं मेयं लिङ्गस्याव्यभिचारतः।
संबन्धं केचिदिच्छन्ति सिद्धत्वाद्धर्म्मधर्म्मिणोः॥
लिङ्गं धर्म्मे प्रसिद्धं चेत् किमन्यत् तेन मीयते।
अथ धर्म्मिणि तस्यैव किमर्थं नानुमेयता॥
संबन्धेऽपि द्वयं नास्ति षष्ठी श्रूयते तद्वति।
अवाच्योऽनुगृहीतत्वान्न चासौ लिङ्गसङ्गतः॥

(न्यायवार्त्तिक तात्पर्य्य टीका, १-१-५, पृः १२०)।

[2] प्रत्यक्षागमाभ्यां नोपमानं भिद्यते। कथमिति। यदा तावुभौ गोगवयौ प्रत्यक्षेण पश्यति। तदा ह्ययमनेन सरूप इति प्रत्यक्षतः प्रतिपद्यते। यदापि शृणोति यथा गौरेवं गवय इति तदास्य शृण्वत एव बुद्धिरुपजायते केचिद् गोधर्म्मा गवये अन्वयिन उपलभ्यन्ते केचिद् व्यतिरेकिण इति अन्यथा हि यथा तथेत्येव न स्यात् भूयस्तु सारूप्यं गवा गवयस्य इत्येवं प्रतिपद्यते तस्मान्नोपमानं प्रत्यक्षागमाभ्यां भिद्यत इति। गवा गवयसादृश्यं प्रतिपद्यते गवयसत्तां वेति। अहो प्रमाणाभिज्ञता भदन्तस्य गवा गवयसारूप्यप्रतिपत्तेस्तु संज्ञा-संज्ञि-सम्बन्धं प्रतिपद्यते इति सूत्रार्थः। तस्मादपरिज्ञाय सूत्रार्थं यत्किञ्चिदुच्यते। (न्यायवार्त्तिक १-१-६, पृः ६०-६१)।

तदीदृशमुपमानफलम् अविद्वान् सादृश्यज्ञानं सादृश्यविशिष्टज्ञानं

mony)[1] as separate forms of evidence, but included the former in perception and the latter in perception and inference. Dignāga criticised Vātsyāyana's inclusion of *manas* (mind)[2] among the sense-organs, while his own theory of *sāntaratva* (interstice or interval)[3] was criticised by Udyotakara and Vācaspati.

Dignāga is said to have cited an instance of inference contrary to perception, and his view was criticised by Kumārila Bhaṭṭa, as we learn from Pārthasārathi Miśra's gloss. on 59–60, Anumāna-pariccheda of Kumārila's vārtika on the 5th sūtra of Jaimini. Udyotakara and Vācaspati Miśra too[4] criticise the same view of Dignāga.

वो[नो]पमानफलमिति भ्रान्तो भदन्तो दिङ्नाग आक्षिपति । ... भदन्तभ्रान्तिमुद्घाटयति ।

(न्यायवार्त्तिक तात्पर्य्य टीका, १-१-६, पृः १३५) ।

[1] आप्तोपदेश इति किमाप्तानाम् अविसंवादित्वं वा प्रतिपद्यते आहोस्विदर्थस्य तथाभाव इति । यदि आप्तनाम् अविसंवादित्वं प्रतिपाद्यते तदनुमानात् । अथ अर्थस्य तथाभावः सोऽपि प्रत्यक्षेण । यथा ह्ययमर्थं प्रत्यक्षेणोपलभते तदा तथाभावमर्थस्य प्रतिपद्यत इति । तन्न । सूत्रार्थापरिज्ञानात् । नायं सूत्रार्थः । आप्तोपदेशः शब्द इति । अपि तु इन्द्रियसम्बन्धासम्बद्धेषु अर्थेषु या शब्दोल्लेखेन प्रतिपत्तिः सागमार्थः । तस्मादसम्बद्धोऽयं विकल्पः ।

(न्यायवार्त्तिक १-१-७, पृः ६३)

अत्र शब्दं प्रमाणान्तरमसहमानो दिङ्नागस्तल्लक्षणं विकल्प्य आक्षिपति । (न्यायवार्त्तिकतात्पर्य्यटीका १-१-७, पृः १०८) ॥

[2] तदनेन मनसश्चेत्यादि भाष्यं व्याख्यातं । तद्दूषितं दिङ्नागेन—
अनिषेधादुपात्तं चेदन्येन्द्रियरुतं वृथा ।

(न्यायवार्त्तिकतात्पर्य्यटीका १-१-४, पृः ९७-९८) ।

[3] यथोक्तं दिङ्नागेन । सान्तरग्रहणं न स्यात् प्राप्तौ ज्ञानेऽधिकस्य च ।

(न्यायवार्त्तिकतात्पर्य्यटीका १-१-४, पृः ७६-७७) ।

[4] यत् पुन र्दिङ्नागेन प्रत्यक्षविरुद्धमनुमानमुदाहृतं तदुपन्यस्यति । अपरे पुनरिति । अश्रावणः शब्दः कृतकत्वाद् घटादिवदिति ब्रुवाणः शब्दस्वरूपमेवापलपति ।

(न्यायवार्त्तिकतात्पर्य्यटीका १-१-१, पृः ३१) ।

Jayanta in his Nyāyamañjarī (3rd āhnika, p. 131, Vizianagaram Sanskrit series) probably alludes to Dignāga in the subject called "Bhadanta-kalaha."

Buddhistic references to Dignāga.

I have already referred to the fact that Dharmakīrti wrote a commentary[1] on a certain work of Dignāga besides alluding to his logical views in the Nyāya-bindu. It was Dharmottarācāryya[2] who explicitly mentioned Dignāga sometimes under that name, but often under the name of Dignāgācāryya or simply Ācāryya. Jinendrabodhi[3] and others wrote commentaries on Pramāṇasamuccaya of Dignāga.

Dignāga's date.

The exact date of Dignāga is not known. On the authority of Mallinātha we have found that Dignāga was an opponent of Kālidāsa, and from Tibetan sources we have seen that he was a contemporary of one Īśvara-Kṛṣṇa who, I believe, was no other person than the celebrated author of the Sāṃkhya-kārikā. From Sanskrit sources we have further learnt that Dignāga was anterior to Udyotakara but posterior to Vātsyāyana, and that Kumārila Bhaṭṭa and Dharmakīrti flourished after the time of Dignāga. But these facts do not help us much, as the dates of most of these writers are unknown. From Chinese sources we know that Īśvara-Kṛṣṇa's Sāṃkhya-kārikā was translated into Chinese by Paramārtha 557-567 A.D. (Nanjio's Cat.,

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[1] Compare.

अयं च विरुद्ध आचार्य्यदिङ्नागेनोक्तः । सः कस्माद् वार्त्तिककारेण सता त्वया नोक्तः । (न्यायबिन्दुटीका पृः ७८) ।

[2] ननु आचार्य्येण विरुद्धाव्यभिचार्य्यपि संशयहेतुरुक्तः ।

(न्यायबिन्दुटीका, पृः ८४) ।

सत्यमुक्त आचार्य्येण । मया त्विह नोक्तः ।

(न्यायविन्दुटीका, पृः ८४) ।

क्व तर्हि आचार्य्यदिग्‌नागेनायं हेतु दोष उक्त इत्याह ।

(न्यायविन्दुटीका, पृः ८४) ।

तदाश्रयो विरुद्धाव्यभिचारी उक्त आचार्य्येणेति ।

(न्यायबिन्दुटीका, पृः ८५) ।

[3] Jinendrabodhi's commentary on Pramāṇa-samuccaya is named "Viśālāmalavatī nāma Pramāṇa-samuccaya-ṭīkā"—Tibetan ཡངས་པ་དང་དྲི་མ་མེད་པ་དང་ལྡན་པ་ཞེས་བྱ་བའི་ཚད་མ་ཀུན་ལས་བཏུས་པ འི་ འགྲེལ་ བཤད་ by སློབ་དཔོན་ རྒྱལ་དབང་བློས། It is contained in the Tangyur, section Mdo-Volume Re.

1300). One of Jina's works was also translated about the same time and by the same translator (**Nanjio's** Catalogue i. 10). We have already seen that Jina was identical with Dignāga. These lead us to conclude that Dignāga flourished before 557 A.D.

From Tibetan sources we have further found that Dignāga was a disciple of Vasubandhu. Now Vasubandhu[1] was contemporary of Lha-tho-ri, King of Tibet who lived up to 371 A.D.[2] There seems to have existed a Sanskrit work[3] on the life of Vasubandhu which was translated into Chinese by Kumārajīva A.D. 401–409. These facts go to show that Vasubandhu lived in the middle of the 4th century A.D. and Dignaga about 400 A.D.[4]

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[1] *Vide* Pag-sam-jon-zang.

[2] Csoma De Koros's Tibetan Grammar, p. 182.

[3] Nanjio's Catalogue, Appendix i. 6.

[4] Mr. Takakusu in a very learned article on Vasubandhu, published in the Journal of the London Royal Asiatic Society, January 1905, fixes the date of Vasubandhu at about A.D. 420-500. According to this theory Dignāga must have flourished about 500 A.D. Takakusu's chief argument is that Saṃghabhadra was a contemporary of Vasubandhu (*vide* Hwen thsang, I-tsing, Paramārtha's Life of Vasubandhu, etc.), and was the translator of the Samantapāsādikā of Buddhaghosa into Chinese in 488 A.D.

29. *Vidyāpati Thākur.*—*By* G. A. GRIERSON, C.I.E., PH.D., D. LITT., *Honorary Member of the Asiatic Society of Bengal.*

I have read with great interest the account of the collection of Vidyāpati's poems, which is given by Bābū Nagendra Nāth Gupta on pp. 20 and ff. of the Extra No of Vol. LXXIII, Part I, of the Journal of the Asiatic Society of Bengal. He has been kind enough to refer to the small collection of songs published by me about twenty-three years ago. In order to facilitate his labours, may I state at once that I have learnt a good deal since then, and that I by no means maintain all that I wrote about Vidyāpati in 1882.

Bābū Nagendra Nāth Gupta refers to the deed of gift of the village of Bisphī as if he considered it to be a genuine document. I am afraid that this contention can hardly be sustained. The plate contains a date in the Faslī San, and that date was long before the Faslī era had been invented. He will find a facsimile of the grant in the Proceedings of the Society for August, 1895. My reasons for considering it to be spurious are given in full on page 96 of Vol. LXVIII (1899), Part I, of the Journal. See also Dr. Eggeling's Catalogue of Sanskrit MSS. in the India Office Library, Part IV, No. 2864.

The following list of articles on Vidyāpati may be useful:—

J. Beames. *The Early Vaishnava Poets of Bengal.* Indian Antiquary, II, 1873, p. 37.

J. Beames. *On the Age and Country of Vidyāpati.* Ibid. IV, 1875, p. 299.

Article in the *Baṅga-darśan*, Vol. IV, 1282 B.S. (Jyaiṣṭha), p. 75.

S'āradā-caraṇ Maitra. *Introduction to Vidyāpatir Padāvalī.* Second edition, Calcutta, 1285, B.S.

G. A. Grierson. *Vidyāpati and His Contemporaries.* Indian Antiquary, Vol. XIV, 1885, p. 182.

G. A. Grierson. *On some Mediæval Kings of Mithilā.* Ibid. Vol. XXVIII, 1899, p. 57.

Paṇḍit Chandā Jhā, referred to by Bābū Nagendra Nāth Gupta, has published a useful edition of the Sanskrit text of the *Puruṣaparīkṣā*, together with a translation into Maithilī. It was printed at the Rāj Press, Darbhangā, in 1296 F.S. He has added a valuable Appendix dealing with historical questions, and containing frequent quotations from the *Kīrtti-latā*, a work of Vidyāpati partly written in the Maithilī of his time. If these quotations are correct, they show that the vernacular of the poet's time differed widely from modern Maithilī, and was rather a form of Prakrit.

I believe that Mahāmahōpādhyāya Paṇḍit Hara Prasād S'āstrī discovered a very old collection of Vidyāpati's poems in Nēpāl in the year 1899. He was kind enough to send me a copy of one of them, which showed much the same Prakritic appearance. I had published a current version of the same song in my edition of 1882, and the points of difference showed that there had been extensive modernization in the language of my copy. The same is no doubt also true with regard to all the genuine songs in my collection.

I am very glad to learn that an attempt is going to be made to publish a correct text of the dainty sonnets of the old Master-Singer, and I look forward to its appearance with pleasant anticipations.

30. *Some remarks on the Geology of the Gangetic **Plain.**—**By***
E. MOLONY. [With one plate.]

It requires no argument to prove that the present gangetic plain is the alluvial deposit of the river Ganges, and that the whole of the area of the gangetic plain south of the Himalayas must at one time have consisted of a network of morasses and river-channels very similar to the Sunderbans at the present time. It is also evident that, over the whole area of the United Provinces of Agra and Oudh, so far from the Ganges being at present engaged in raising its flood plain, it has become an agent of denudation, and has, long since, entered on the work of denuding the whole of its plain which lies above flood-level.

It may be taken as proved that this great change has been occasioned by the submergence of the area at the mouth of the river.

The period at which this important movement took place must have been very remote.

The river has eroded a bed in the old alluvium which is in many places several miles in width.

Within the limits of the former bed there is a considerable amount of later alluvium, but it varies very much from the older alluvium in its characteristics, and, in most places, there is a very well-marked line of demarcation between them

Most of the recent alluvium is liable to be flooded during high floods of the Ganges, though there is some which has never been flooded during the memory of man. This is probably due to deposit of sand and light soil by the action of the wind during the hot weather.

In the recent alluvium the substratum is nearly always pure river sand, the finer soils being deposited in shallow water where the current is usually less.

Another difference is that the recent alluvium never contains nodular limestone (*kunkar*), which occurs in most places in the old alluvial deposits.

I have perhaps made this assertion more positive than the text-books would appear to warrant, but I have never come across an instance in which *kunkar* was found in soil that clearly belonged to the recent alluvium, though I have occasionally found it in a locality near the boundary of the new and old alluvium.

The soil also differs, the recent alluvium being generally much more fertile, at any rate in the eastern portion of the United Provinces, where the recent alluvium contains a percentage of the black cotton soil brought down by the Jumna and its tributaries from Central India.

The area that lies between the extreme limits up to which the Ganges has excavated its bed in the old alluvium may be styled the "Khādir."

Having had good opportunities for observation in the Ghazipur

District, I have marked in on a map of the district the limits of the "Khādir."

I may say that in some places the limit of the "Khādir" is exceedingly plain, whereas in other places it is not at all so plain to the eye.

However, by tracing the line from one curve which is well defined and following slight indications, it is almost always possible to follow the line till it reaches another point where the indications are again quite unmistakeable.

In the Ghazipur district the only part where, in my opinion, the line is really doubtful, is the western edge of the island of old alluvium opposite the confluence of the Ganges and Kārmnāsa. Both the northern and the southern edges of that island are extremely well defined as far west as a line drawn north and south just west of Birpur; but the western edge is very ill-defined.

In my opinion, two causes have united to create this difficulty. The first is the proximity of the deep stream of the Ganges within comparatively recent years, which has led to a great accumulation of water-borne material; and the second is the proximity to the west of the boundary of a large sandy tract whence a considerable amount of material has probably been blown by the strong west winds which prevail during the early part of the hot weather.

It is clear that at any particular time each bank of the river must have concave bends alternating with convex bends. Centrifugal force throws the current against the concave bends and away from the convex bends. Erosion, therefore, only takes place at the concave bends, and this is the reason why the edge of the "Khādir," as delineated on the map, does not contain any convex bends.

The fact that these concave bends, which form the limits of the "Khādir," are not connected by convex bends, but cut each other at various angles, proves that no two adjacent bends could have been made at the same time.

The width and shape of the "Khādir" opposite the town of Ghazipur show that there must have been many complete alterations in the course of the river.

Between each of the alterations in the course of the river, indicated by the indentations in the edge of the "Khādir," a very long period must have elapsed.

Although the vagaries of the Ganges are proverbial, it must be borne in mind that, whenever the river impinges on the old alluvium, the process of denudation is very slow.

In the new alluvium the river often cuts away three or four hundred feet in a year, but in the old alluvium, whenever the river impinges on reefs of *kunkar*, there is practically no denudation.

Even where the river impinges directly on the stiffish clay (without any *kunkar* reefs to protect it), which is the prevailing soil in the Ghazipur district, the denudation, as will be shown later, does not exceed ten feet in the year.

It will be noticed that all sharp bends of the river are in the old alluvium, and that the main direction of the river's course is determined by the bends in the old alluvium. Although, in the new alluvium, the river does, at times, rapidly make considerable changes in its course, yet its general direction remains constant for long periods of time, owing to the fact that it is determined by the bends in the old alluvium, which alter very slowly.

There is no historical record of the river ever having been at any distance from either Zamania, Ghazipur or Chausa, although the configuration of the "Khādir" shows that, at some past period, it must have been several miles distant from each of these places.

The same probably holds true of both Benares and Chunar. At the time of the battle of Chausa, where Humayun was defeated in 1539 A.D., the point of confluence of the Ganges and Kărmnăsa must have been at the same place as at present, though it is clear, from the island of the old alluvium just opposite, that, at one time, the Ganges must have been flowing a considerable distance to the north, and the confluence of the Ganges and Kărmnăsa must have been east of Buxar. There is, therefore, unmistakeable historical evidence that there has been no radical alteration in the course of the Ganges in the Ghazipur District for close on four hundred years.

At Chochakpur there has been very little alteration in the course of the river. The configuration of the "Khādir" in the reach between Chochakpur and Zamania can be accounted for by supposing that between Chochakpur and Karanda the river originally flowed nearly east to west, and that the great bend at Zamania has been the result of gradual and continuous erosion by the river.

The distance between Karanda and the point of the bend at Zamania is 72 miles or 39,000 feet.

Allowing 4,600 feet as the original width of the river, this would give a distance of 35,000 feet which has been eroded by the river.

The first survey was made of the district in 1840. From that time to 1872 Mr. Oldham records in his Memoirs of the Ghazipur District that the annual rate of erosion was 12 feet (*vide* p. 3 of Oldham's *Memoirs of the Ghazipur District*). Since the last survey, made in 1882, the annual rate of erosion has been 9 feet. This gives an average of close on 11 feet a year for the last 64 years.

At this rate the erosion of the Zamania bend would require about 3,200 years. At the Zamania bend the soil is the ordinary stiff clay found in the district without any *kunkar* reefs. There is, however, a *kunkar* reef at Zamania town, and very solid *kunkar* reefs at Ghazipur.

Another noteworthy feature shown by the map is the island of old alluvium opposite Chausa surrounded on all sides by the "Khādir."

It is stated in Mr. Oldham's Memoirs that a similar island exists in the Benares District opposite Saidpur. I have not had an opportunity of verifying the statement, and have not therefore shown it on the map.

Mr. Oldham's is the only possible explanation, *viz.*, that the river Ganges has gradually eroded the land at some bend in its course till it has cut into the course of the affluent at a point above the former confluence.

When once a channel had been made into the course of the affluent, centrifugal force would drive the water of the Ganges through the breach so made, and the new channel would rapidly be widened out till it became the main course of the Ganges.

The island opposite Chausa must have been caused by the Ganges usurping the course of the Kărmnāsa, and that opposite Saidpur by the usurpation of the course of the Gumti.

Similarly, tradition, which Mr. Oldham considered trustworthy, says that, at one time, the water of the Gogra passed down the present river Sarju, or Tons as it is sometimes styled, which separates the Ghazipur and Ballia Districts. This would indicate that the Ballia District consists of a similar island caused by the river Gogra (or Sarju as it is called in some parts) usurping the course of some smaller river that used to flow down the present bed of the Gogra.

Any such usurpation of another river's course would probably completely alter the set of the current at the old confluence, and release the river from the bends in the old alluvium which had formerly given the river its general direction.

At the commencement of the paper it was taken as already proved that the area at the mouth of the Ganges was an area of subsidence.

There are, however, indications that within the area of the United Provinces of Agra and Oudh the southern portion of the Gangetic plain has sunk relatively to the northern portion.

The first piece of evidence is that supplied by the artesian well sunk at Lucknow. (*vide* Oldham's *Geology of India*, p. 434.)

At a depth of 158 feet the water stood at 61 feet below the top of the borehole. At a depth of 975 feet the water had risen to 2 feet. At 990 feet it stood at a depth of 5 feet below the top of the borehole, and at 1,189 feet the water rose over the top of the casing, itself 24 feet above the surface of the ground.

This shows that the lower strata must be inclined, though it does not indicate the direction of the dip.

As the Himalayas are known to have risen and the Gangetic plain to have sunk, the probability is that the dip of the strata is from north to south.

A river flowing over a flat alluviual plain would naturally find its way directly down the slope, and there is no reason why the watershed should not be equidistant from either bank.

If, however, after the river had excavated a channel for itself with the watershed equidistant from either bank, the whole alluvial plain through which it flowed was slightly tilted at right angles to the river's course, the result would be that the slope into the river from one bank would be increased, while the slope to the other bank would be decreased. Consequently, denudation on one side of the river would be greater than on the other. The same thing would happen to all the rivers flowing on parallel courses. Thus, in the area between two rivers which run on nearly parallel courses, the denudation into one river would be greater than into the other. Each river would, in time, force the water-shed on one bank back towards the next river, but, in exchange, would lose on the other bank an equivalent in its catchment area.

The result would be that each river would have a larger catchment area on one bank than on the other. This appears to be the case in several districts of the United Provinces with which I was acquainted.

Canals are generally aligned to run along the water-sheds, and in the following cases the canals are aligned very near the rivers running parallel to them on the north side :—

(*a*) The main upper Ganges canal in the Aligarh District is very much nearer the Kali Naddi on its north than the Jumna on the south.

(*b*) The Anupshahr branch of the Ganges canal in the Aligarh District is very much nearer the Ganges on its north than the Kali Naddi on its south.

(*c*) The projected Sarda canal in the Lucknow District was aligned very much nearer the Gumti on its north than the Sai on its south.

The fact that, at Lucknow, water from a great depth rose to above the surface, shows not only that the strata at great depths are inclined, but that they are continuous over very considerable distances.

This is a very interesting fact, because it has been conclusively shown that the surface strata are not continuous.

For certain reasons too technical to be given here a good irrigation well can only be made where the masonry cylinder can be taken down to a firm clay stratum underlaid by waterbearing sand.

A good deal of attention has therefore been paid to the strata near the surface, by which I mean down to a depth of say 125 feet.

Colonel Clibborn was deputed in the seventies to make an examination into the subject of wells, and, in his report published by the Board of Revenue of the North-West Provinces and Oudh, in a collection of papers relating to the construction of wells, it is clearly demonstrated that the clay strata so essential to the success of wells are not continuous.

I might add that anyone practically acquainted with the construction of irrigation wells knows that Colonel Clibborn's conclusions are correct.

A very difficult problem is here presented to us ; how can we account for the fact that the surface strata are clearly not continuous, while those at great depths appear to be continuous ? Two possible explanations suggest themselves ; the first is that at great depths, the pressure of the superincumbent earth renders impervious to water everything but the coarser and cleaner kinds of sand.

Extensive and continuous deposits of such sand would only be found along the beds of the larger rivers which may be presumed to have existed though they have been long since deeply buried by alluvial deposits.

If a deep borehole struck such an old river-bed, it is conceivable that the necessary head to bring the water to the surface might be supplied through a deposit of sand in the former river-bed continuous up to a point in its uppper course where it attained the necessary elevation.

The observed facts at Lucknow do not, however, support this explanation, as there were several rises in the level of the water in the borehole, and it seems unlikely that one borehole should have struck the beds of several such former rivers one above the other.

The second possible explanation is that the surface deposits were laid down in running water and the deeper deposits in still water. Anyone acquainted with the country can see in the crescent-shaped swamps and the alternations of clay, light soil and sand on the surface of the country, the result of the same agency that is reproducing similar features in the alluvium of the great rivers, namely deposition by running water; and the inference is inevitable, that the surface of the country was formed by the deposit of the material derived from the mountains in a labrynth of vast morasses amd deltaic rivers.

This agency, however, would not explain the enormous area of clay and sand revealed to us by the Lucknow borehole; and it seems necessary to assume the existence of an enormous sheet of water with currents sufficient to transport sand great distances to account for the phenomena.

In Oldham's *Geology of India*, p. 144, the occurrence of a species of fresh-water porpoise, common only to the Ganges and Indus and their tributaries, is cited as showing that the Ganges and Indus flowed at one time into the sea through a common delta.

The sea is shown to have extended up the Indus valley within a geologically recent period; and it seems possible that it may have extended east much further into the gangetic plain than is usually supposed.

The absence of any indications of marine origin in the upper strata might well be due to their having been deposited in fresh water after the communication with the sea by the Indus valley had been cut off.

At any rate, whether the water was fresh or salt, the continuity of the deeper strata over great distances seems to strengthen the theory that the lower strata were deposited in a great sheet of still water.

Such a great sheet of water, originally salt but gradually becoming fresh as the communication with the sea became gradually more and more obstructed, would satisfactorily account for the change of the salt-water porpoise into an animal inhabiting fresh water.

31. *The Nafāīsu-l-Maāṣir*—*By* H. Beveridge, I.C.S. (retired).

Among the Elliot manuscripts in the British Museum there is a volume which contains, among other things, about a hundred pages of an extract from the Nafā'īsu-l-Maāṣir. It is numbered Or. 1761 and is described at p. 1022*a* of vol. III of Rieu's Persian Catalogue. The title Nafā'īsu-l-Maāṣir may be rendered "Choice Deeds," and is a chronogram implying that the book was begun in 973 (1565–66). It is stated by Dr. Sprenger that a postscript gives 979 as the date of the completion of the work, but that much later dates are mentioned in it. The work was a biographical dictionary of Persian poets and was written by Mīrzā 'Alāu-d-daulah Qazvīnī, the younger brother of Mīr 'Abdu-l-laṭif, who was for a time Akbar's preceptor. 'Alāu-d-daulah was himself a poet, and wrote under the name of Kāmī. He is described by Badayūnī at pp. 97 and 316 of the third volume of his history. A copy of the original work was seen by Dr. Sprenger in the Moti Mahall Library in Lucknow, and he has described its contents at pp. 46-55 of his Catalogue; but apparently the manuscript was lost in the Mutiny, and there does not seem to be any copy in our public libraries. It is to be hoped that a copy will turn up in India some day for the work was a valuable one and was the basis of Badayūnī's third volume. Sprenger states that the book contained notices of about 350 poets, most of whom flourished in the time of Akbar. He also gives the index of the names. Fortunately the Elliot MS. contains the historical introduction which gives an account of the reigns of Bābar, Humāyūn and Akbar. The account of Akbar is the fullest of the three, but only goes down to 982 or 1575, *i.e.*, to the twentieth year of the reign. Though the historical introduction is only a sketch, it gives here and there useful bits of information, and it is valuable as being, apparently, the earliest written of all the lives of Akbar. Like his father Mīr Yahyā, the author of the Labb-u-tawārīkh, 'Alāu-d-daulah is very fond of chronograms, and gives many of them in his introduction. Among others he gives the well-known one about Bābar's birth, and adds that it was composed by Maulānā Jāmī. This cannot have been the great Jāmī. On p. 26*b* he speaks of Bābar's religious poem, and corroborates Sprenger's statement that it was entitled "Dar Fiqh." He adds that it was sent to Ḥaẓrat Imām A'ẓam, who is probably the same person as the Maqdūm A'ẓam of Transoxiana whose name is mentioned in Ney Elias's history of the Khojas. That is, he is probably one of several Maqdūm A'ẓams, for the name was borne by more than one saint. At p. 33*b* we have the statement that Humāyūn conversed in Herat with the writer's father, here called Amīr Nāṣiru-d-dīn Yahyā. At p. 37*b* mention is made of a Khwājah Qāẓī who was Humayun's prime minister and who, unless he be the same as Khwājah Ghāzī, does not seem to be named by other authorities. It is added that he belonged to the family of the famous enthusiast Shams-i-Tabrīzī. The account of Humāyūn's death gives one or two new details. In the first place it says that the accident of the fall from the roof occurred on Friday the 16th Rabī-al-awwal, and not on the 11th, and that he died on the following Sunday the 18th. Then it adds, p. 37*b*, that Humāyūn was wrapped in a blanket, or dressing-gown (*galīmwār*) at the time, and was leaning on his staff when the latter slipped on the stones. When he came to his senses, he repeated the *Kalima*. Then follow several chronograms. K̲h̲iẓr K̲h̲wājah K̲h̲ān, the husband of Gulbadan Begam, is mentioned as one of those who concealed the fact of the death for some days.

In the account of Akbar's conquest of Ḥājīpūr we are told that Rajah Gajpati (of the Dumraon family) assisted with 2,000 Cherus, and in mentioning Dā'ūd's escape by boat from Patna on the night of Sunday 21 Rabī-as̱-s̱ānī the new circumstance is given that he fled to Tānda. When the bridge over the Pūn Pūn was broken down by the flying Afghans, some 2,000 of them were killed.

The Elliot MS. gives, besides the introduction, a few extracts from the notices of poets in the body of the work. Among them is the interesting account of Wafaī, *i.e.*, Zainu-d-dīn K̲h̲wāfī, who was Bābar's Ṣadr, or ecclesiastical judge, and who translated, or paraphrased Bābar's Memoirs. It is this account which has been borrowed by Badayūni (see Dr. Ranking's translation, p. 609).

I hope that this notice may lead to the discovery of the original work, and if not, that someone will publish the extracts in the Elliot Manuscript.

24th July, 1905.

32. *Notes on the Species, External Characters and Habits of the Dugong.*—*By* N. ANNANDALE, D.SC., *Deputy Superintendent of the Indian Museum.* [With three plates.]

The present communication is largely of the nature of a preliminary notice. Later I hope to offer to the Society a memoir on the anatomy of certain organs and structures in the Dugong, which will be based partly on the specimen whose measurements are given below, and partly on the fine collection of Indian and Australian skulls and other bones already in the Indian Museum. At present I feel confident in stating (with four fully adult Indian, two fully adult Australian, and parts of three immature Indian skulls before me) that the individual variations among Indian specimens are at least as great as those which were believed by Owen to constitute a specific difference between Indian and Australian species. Skeletons of the Dugong exhibit very great differences (not solely connected with sex and age) *inter se*, and these cannot be specific, as they are not constant even in a series from the same seas. Owen's *Halicore australis*, therefore, must be relegated, as most recent mammalologists have thought probable, to the synonomy of *H. dugong.*[1]

In the summer of 1905, I was deputed by the authorities of the Indian Museum to visit the northern part of the Gulf of Manaar, in order to obtain a complete skeleton and skin of an Indian specimen of the Dugong, the only skins hitherto in the collection, and the most nearly perfect skeleton, having been obtained from Queensland in exchange with the Brisbane Museum. Thanks largely to the kind offices of the Rev. A. D. Limbrick, of Rámanád, I was so fortunate as to obtain a fine male, the external characters of which are described below:—

Dimensions—

1 Length to tip of tail	9 ft.,	6 in.
2 Length to extremity of fluke ...	9 ,,	11 ,,
3 From posterior border of anus to tip of tail	3 ,,	4 ,,
4 From anterior border of anus to genital opening ...	1 ,,	5 ,,
5 Length of flipper	1 ,,	8 ,,
6 Width of flipper		10 ,,
7 Breadth of fluke (injured at one extremity)	2 ,,	10 ,,
8 Height of facial disk		8 ,,
9 Breadth of facial disk ...		11 ,,
10 Length of upper lip (upper jaw pad)		6½ ,,

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[1] Strictly speaking, the specific name should be *duyong*, in accordance with the Malay; but the incorrect form is so well known that it seems better not to change it.

In this table and throughout the paper the "tip of tail" means the extremity of the actual tail. The length between this point and the extremity of the snout was measured by means of sticks stuck into the sand. The "length to extremity of fluke" was obtained by drawing a straight line immediately in front of the snout and another parallel to it immediately behind the uninjured extremity of what may be called, on the analogy of the Cetacea, the fluke. The posterior margin of this organ being concave, the latter measurement is considerably the greater. The third measurement given practically represents the length of the tail, which is a little less than half that of the head and body. This observation is perhaps of some importance, as the pads of stout connective tissue intervening between the dorsal vertebræ are of considerable thickness, although there are no bony epiphyses. Consequently, skeletons, as set up in museums, very often do not represent anything approaching the true length of the animal. By the "facial disk" I mean the flattened area, which does not include the nostrils, above the tusks. It will be described in detail later. What I have called the "upper lip" is plainly the homologue of what Murie and others have called the "upper jaw pad" in the Manatees; but it is better developed in the Dugong and probably plays a more important part in the assimilation of food.

Colour—

The dorsal surface, shortly after death, was a dull brownish grey, which faded gradually, though pure grey on the sides, to dirty flesh-colour on the belly. The face, flippers and fluke were dull grey; but the skin round the base of the tusks and the upper lip was mottled with dirty flesh-colour, which was also the tint of the lower jaw. Judging from the different descriptions given by different observers, the coloration of the animal is as variable as I find its skeleton to be.

Integument—

The skin of the specimen had not the corrugated and wrinkled surface of that of the Manatees; but, on the other hand, it had not quite the smooth and oily appearance of that of many of the Cetacea. It was smooth, as it were, but not polished. Undoubtedly the hair, especially on the back, contributed to this effect, giving the animal quite a prickly appearance in certain lights. I shall here state merely that three distinct kinds of hair existed on the external surface, two on the facial disk and lower jaw, and a third over the whole of the trunk, limbs and fluke, the the kind last mentioned having two distinct phases of growth. The hairs are apparently devoid of pigment. The general character of the integument, apart from the hairs, resembled that of tropical Cetacea, the "blubber" being less thick than that of northern Porpoises. No oil was set free by cutting through it. Beneath it, however, there was a layer of opaque white fat very like that of a pig in appearance.

General Characters of the Trunk and Limbs—

The general form differed very considerably from that of all Cetacea, resembling that of some of the larger Eared Seals in several points. The appearance of the animal was clumsy, and evidently not adapted for rapid motion of any kind, the back and sides being rounded and the belly flat. There was no apparent neck, but the head was massive and terminated bluntly in front. The tail was distinct from the trunk, having a more compact and a less amorphous character. The vertebral column extended to the tip, which projected slightly below the edge of the fluke. The latter organ was deficient as regards one extremity, which had been removed, probably by the bite of a shark. The wound had healed completely. Running from near the tip of the tail to a point near its commencement was a conspicuous ridge formed chiefly by a thickening of the epidermis. This was about two inches high near the centre. It is well shown in the photograph reproduced on plate 7. The fore-limbs were regular in outline, flattened, with a distinct posterior fringe, but with no trace of separation of the digits externally. Only the fore-arm projected externally, the humerus being buried in the body as far as the articulation of the radius and ulna. There was a conspicuous fold of skin immediately above the limb. The mammæ, which were large considering the sex of the individual, were situated immediately behind the limb, almost on a level with its posterior edge; they were long in comparison with their diameter. Judging from a female, otherwise correctly mounted, in the Colombo Museum, this elongated character of the mammæ is characteristic of both sexes. The lateral position is apparently characteristic of all living Sirenia. Native fishermen tell me that in the lactating female the milk squirts out with great violence to a considerable distance if the mamma is pressed. The copulatory organ, of which Dr. Francis H. A. Marshall, of the University of Edinburgh, has kindly promised to furnish a description later, was entirely withdrawn into the body.

Head—

The head of the Dugong is perhaps its most characteristic feature, but all the figures of the animal, including some very recent ones, that I have been able to discover, are incorrect as regards this part, at any rate if they are intended to represent adult males. The only mounted specimens I have seen which are at all correct are those in the Colombo Museum; but these are a female, a half-grown male and a newly (probably prematurely) born young one. Except as regards the tusks, they agree very fairly well with my notes and photographs.

The mouth of the specimen was very small. It was tightly closed by the upper lip ("upper jaw pad") which projected over the lower jaw, the lower lip being represented merely by a thin fold of skin. The upper lip was stout in shape, flabby in structure, in the newly-killed specimen; tongue-shaped, smooth and hairless on the surface. The tusks, one of which was broken, projected through the skin above it, not from the mouth, as has been stated. The curious projection of the anterior part of the lower jaw was only covered by a thin layer of skin and connective tissue; it is the rounded structure which looks like a heavy lower lip in fig. 1, plate 8. Above the tusks the integument expanded into a large flattened disk, which was divided into two halves by a vertical cleft. This cleft also extended along the base of the upper lip between the tusks. The lower part of the disk bore two broadly raised transverse ridges, which were divided from one another by the cleft and covered with bristles comparable to, but shorter and blunter than, the spines of a Porcupine. These ridges are evidently the homologues of the two lobes of the "upper lip," by means of which the Manatees crop the plants on which they feed. They do not appear to be either so mobile or so widely separable, however, in the Dugong. Above them the disc was covered with longer and finer bristles, evidently of a sensory nature. The upper edge of the disk was turned backwards and upwards, and there was a more or less inturned flap on either side. The nostrils were entirely outside the disk, on the top of the head: they were crescentic in shape and could evidently be closed during life. The tissues surrounding the eye were somewhat prominent; but the eye itself was small, black, beady and deeply sunk. It was not surrounded by radiating wrinkles as in the Manatees. The presence of large glands in connection with it afforded some justification for the Malays' belief[1] that the Dugong weeps when captured. The external ear was extremely minute, being a circular aperture less than 10 mm. in diameter.

Habits—

It seems probable that the habits[2] of the Dugong have changed considerably within the last half century, together with the diminution in its numbers noted by Blanford and others. Only having seen a freshly-killed specimen, I am not in a position to say anything on this point from actual observation, but from what I was told by the native fishermen, who possess special nets for the capture of the Dugong, it is rare nowadays for more than one specimen to be taken at a time, whereas formerly, in the Gulf of Manaar, flocks of many hundreds were said to occur. Further, the animal appears to have ceased to frequent shallow water, for, according to the fishermen, the only specimens they see near the shore are those which have been wounded or are sick. I was unable to discover the depth at which those taken for the market are usually captured; but a gentleman who has visited the Dugong "fisheries" off the northern coast of Queensland, tells me that in Australian waters the usual depth is from the ten to twelve fathoms. In the Gulf of Manaar stout nets, very deep, with a large mesh and heavily weighted, are sunk in the neighbourhood of the animal's known feeding-places, and individuals of both sexes, but apparently more especially young ones, become entangled in them and are thus taken. Occasionally specimens are even captured in the ordinary drift nets used in catching fish. I was told that as many as sixty were sometimes brought into Kilakarai, a large native port near the northern corner of the Gulf on the Indian shore, in a year; but this number is probably exaggerated. The Muhammadans of the district are so fond of the flesh[1] that they give large prices for it, and probably the fishermen who possess the right kind of nets go in pursuit of the Dugong as often as they have nothing else to do; for the search is precarious, but the profits considerable should it be successful.

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[1] They regard the tears of the *ikan duyong* ("Dugong fish)" as a powerful love-charm. Muhammadan fishermen on the Gulf of Manaar appeared to be ignorant of this usage, but told me that a "doctor" once went out with them to collect the tears of a Dugong, should they capture one. Though they do not call the animal a fish, they are less particular about eating its flesh than are the Patani Malays and the Trang Samsams, who will not do so unless the "fish's" throat has been cut in the manner orthodox for warm-blooded animals. The common Tamil name for the Dugong is *kădălpūdrū* ("sea-pig"); but the fishermen at Kilakarai (Lubbais) call it *ăvillīah*.

[2] These remarks refer only to the Gulf of Mannar. Major A. R. Anderson informs me that in the Andamans, Dugongs still enter Port Blair harbour occasionally in parties of two or three. *Dec. 15th*, 1905.

As regards the food of the Dugong, it has often been stated, but not by Blanford, that it feeds exclusively on a marine phanerogamous plant. This is evidently not the case, as the stomach of my specimen was full of pieces of a green alga, all of which belonged to one species. Two things struck me about the contents of the stomach and the upper part of the intestines: (1) their freedom from all adventitious growths, either animal or vegetable, and (2) their perfect and unbruised condition. They consisted of clean pieces of seaweed about 2½ inches long, plucked off and evidently not masticated. Even the little bladders which the seaweed bore had not burst. As regards the method of feeding, I do not think that it can be the same as that of the Manatees, which pluck the plants which they eat by means of the two lobes above the "upper jaw pad," and push their food towards the mouth with their flippers. Similar lobes certainly exist in the case of the Dugong, but they did not appear in the fresh specimen to be capable of any great degree of separation or movement, while the flippers are hardly long enough to give any great assistance in feeding. As the "upper jaw pad" (upper lip) itself, on the other hand, was evidently freely moveable and possibly to some extent extensile, it seems possible that it is used in plucking seaweed, which certainly could be grasped between it and the lower jaw. This would necessitate the food being passed under the horny pad, with its bundles of more or less consolidated hairs, on the anterior part of the palate. Possibly these hairs may have the function, as they certainly have the appearance, of the bristles of a scrubbing brush. I have already noted the small size of the mouth, and I believe, judging from the small area of the articular surface of the lower jaw, as well as from observations on the fresh specimen, that the jaw has very little, if any, lateral movement. For all these reasons I doubt whether the persistent teeth have any function beyond crushing the calcarious or other growths brushed off the seaweed by the hair-papillæ of the anterior palate.

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[1] The meat is excellent; roasted, I could not have distinguished it from good, but rather tough beefsteak. It had none of the peculiar flavour of whale-meat. Moreover, it has the same quality as that assigned, both by the old voyagers and by modern observers, to the flesh of the American Manatees—it keeps good for a considerable time, for at least three days in hot weather, during which mutton goes bad in twenty-four hours. The blubber is not made into oil at Kilakarai.

The fishermen told me that they took females with young ones accompanying them at all times of year, but never more than one young one with each female. They had never seen the female raise the upper part of her body vertically from the water, clasping the young one in her flippers, which seem hardly suitable for the purpose. Judging from the scars on the specimen examined, I believe that the males fight with their tusks at the breeding season.

* * *

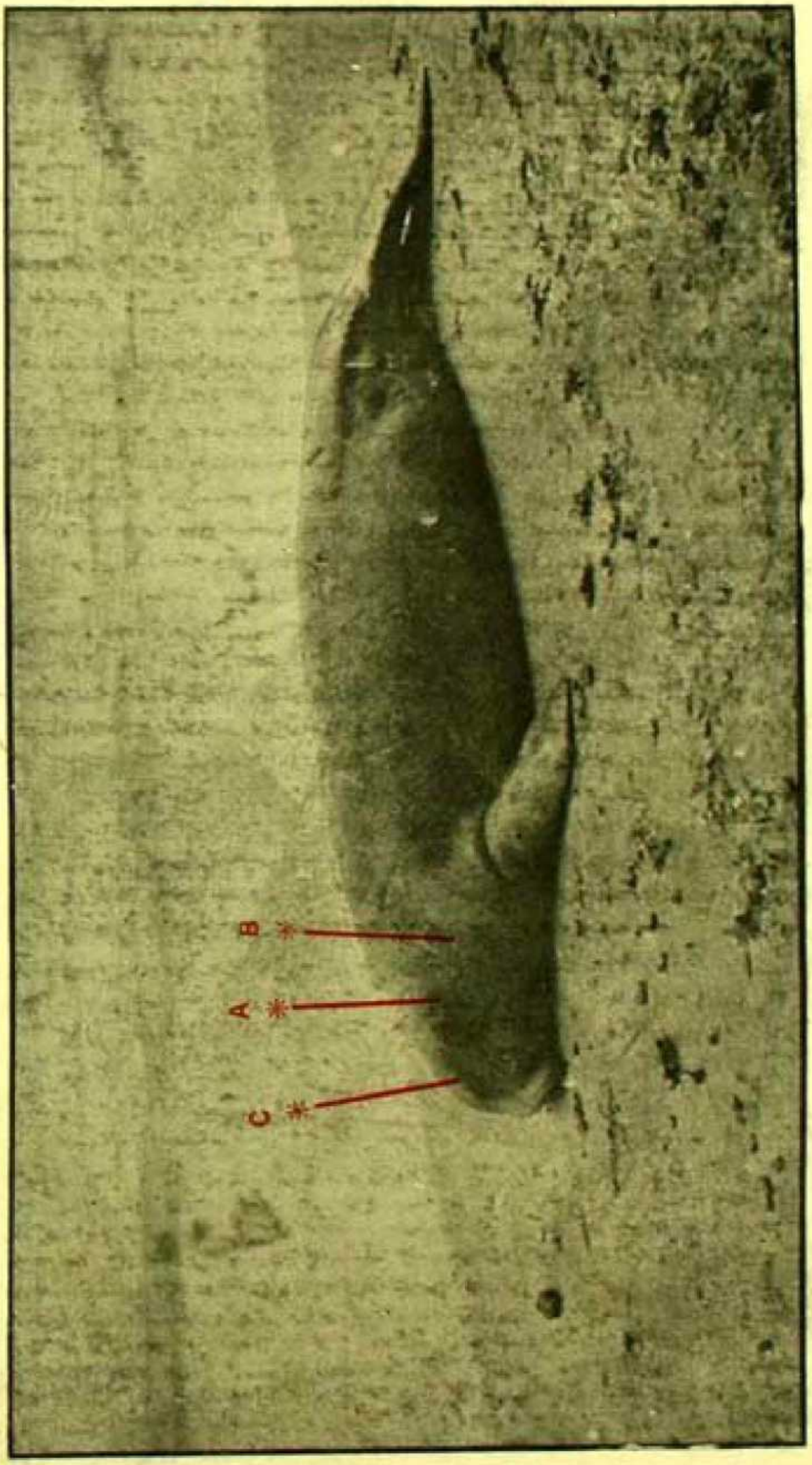
32. *Hedyotis sisaparensis, a hitherto undescribed Indian species.*—*By* CAPTAIN A. T. GAGE. I.M.S.

The writer when re-arranging the earlier genera of Rubiaceæ in the Calcutta Herbarium in 1902, came across what appeared to be an undescribed species of Hedyotis. The writer's opinion was confirmed by Sir George King, who kindly compared the species at Kew. The description written in 1902 is now offered for publication.

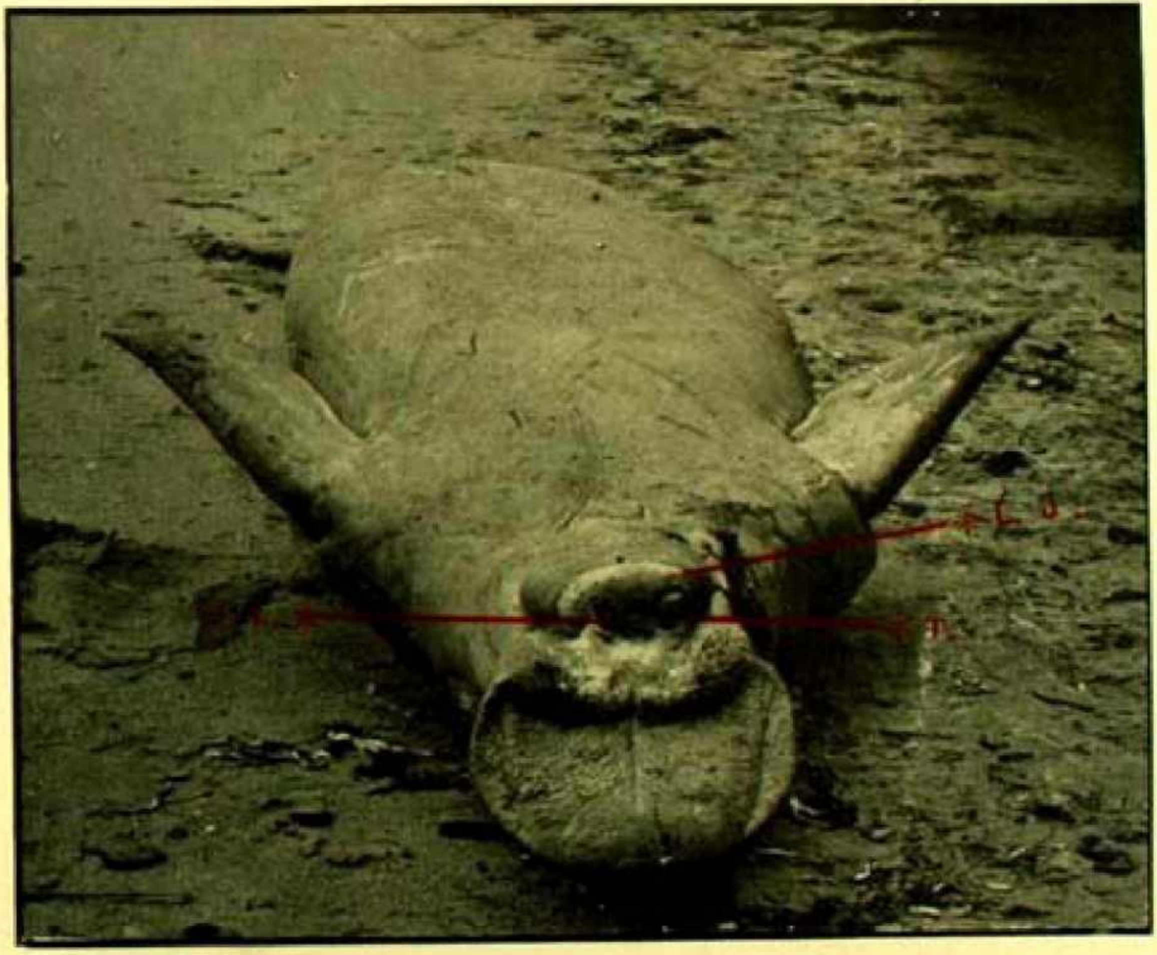
Hedyotis sisaparensis.—Undershrub with branches about as thick as a crowquill, glabrous, pale grey almost white, four angled; internodes much shortened in the region of the infloresence and hidden by the stipules. Stipules about 9 mm. long, pectinate, scurfily tomentose, and showing a few raphides. Leaves shortly-petioled, lanceolatet acute, base narrow cuneate tapering into the glabrous petiole; lamina glabrous on both surfaces, upper surface bright green, lower grey, with abundance of raphides; midrib on lower surface of lamina flattened out, white; lateral nerves 4-6, rather faint, running forward at an acute angle with the midrib; length of lamina 5-8·8 cm., breadth 1·25-2·5 cm, length of petiole 6·5 mm.-1·25 cm. Flowers in axillary bracteate cymes of about 4·5 cm. in length; main peduncle 1·8 cm. long; bracts about 5 mm. long, flowers pseudo-pedicellate in groups of three on the secondary peduncles. Calyx including lobes 8 mm. long, lobes 4, subulate, equalling the length of the calyx-tube, but exceeding the capsule. Corolla, unopened, exceeding the calyx tube, lobes 4. Stamens 4. Ripe capsule 3 mm. in diameter, glabrous, dehiscing septicidally. Seeds not seen.

Wynaad, *Beddome.* Above Sisapara, Nilgiri district, 7,000 feet alt. *Gamble*, No. 13381.

The affinity of this species is with H. mollis, *Wall.*, from which it is easily enough distinguished by its infloresence.

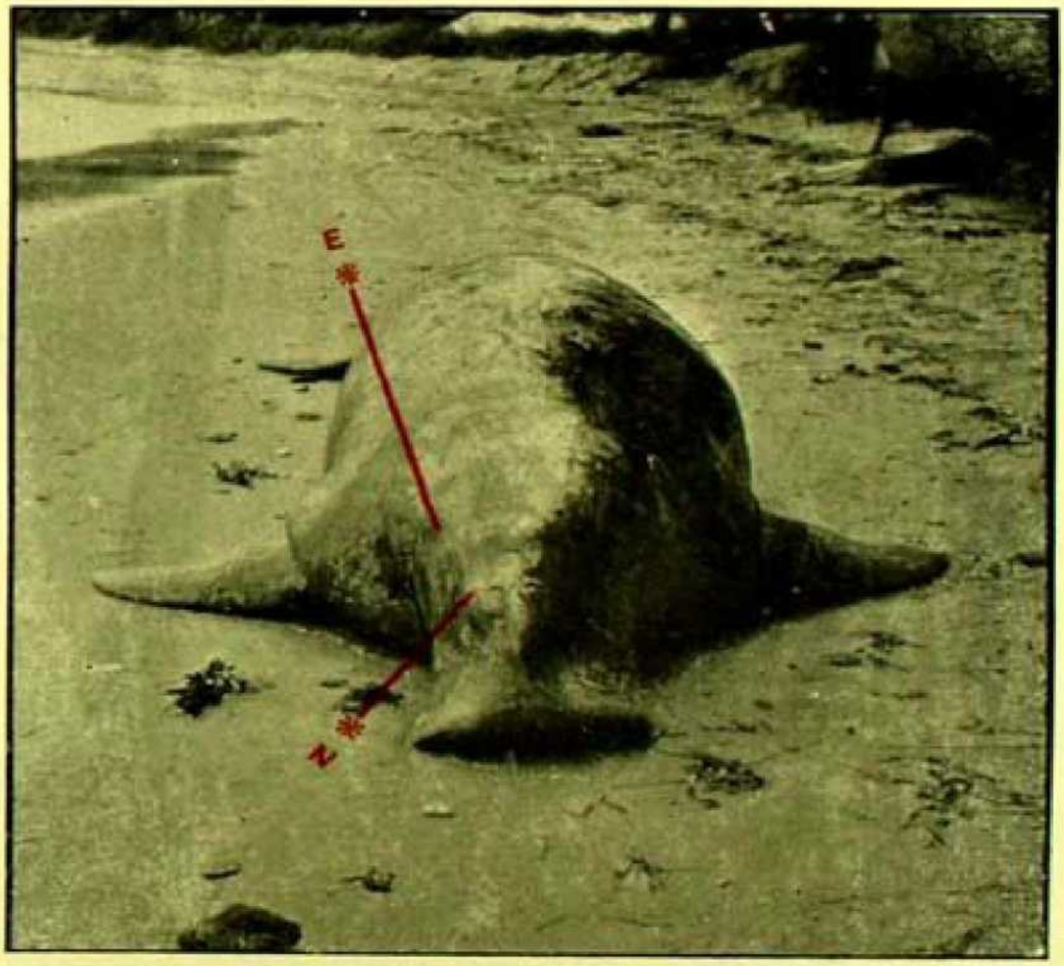


A = Eye. C = Nostril. B = Ear.



U.L. = Upper Lip (Upper Jaw Pad).
T. = Tusk.
L.J. = Lower Jaw.

PLATE IX.



E. = Eye.
N. = Nostril.

DECEMBER 1905.

The Monthly General Meeting of the Society was held on Wednesday, the 6th December 1905, at 9-15 P.M.

The Hon'ble Mr. Justice Asutosh Mukhopadhayya, M.A., D.L., Vice-President, in the chair.

The following members were present :—

Dr. N. Annandale, Babu Muralidhar Banerjee, Major W. J. Buchanan, I.M.S., Mr. I. H. Burkill, Babu Monmohan Chakravarti, Mr. B. L. Chaudhuri, Mr. W. K. Dods, Mr. L. L. Fermor, Rev. E. Francotte, S.J., Mr. H. G. Graves, Mr. T. H. Holland, Mr. D. Hooper, Rev. E. Lafont, S.J., Mr. W. A. Lee, Mr. J. Macfarlane, Mr. R. D. Mehta, Mr. J. R. Nicoll, Hon. Mr. Justice F. E. Pargiter, Mr. G. Pilgrim, Hon. Mr. H. H. Risley, Major L. Rogers, I.M.S., Dr. E. D. Ross, Mr. C. Saunders, Rai Ram Brahma Sanyal Bahadur, Pandit Yogesa Chandra Sastree, Mahamahopadhyaya Haraprasad Shastri, Babu Chandra Narain Singh, Mr. H. E. Stapleton, Pandit Vanamali Vedantatirtha, Babu Amulya Charan Vidyabhushan, Rev. A. W. Young.

Visitors :—Mr. and Mrs. P. Buckland, Mr. J. C. Brown, Mr. J. M. Burjojee, Mr. Douglas H. Campbell, Babu Asutosh Chatterjee, Captain Coldstream, R.E., Dr. J. N. Cook, Mr. and Mrs. J. D. Guise, Mr. Holmes, Mrs. Kilburn, Colonel Macrae, Captain and Mrs. Murray, Mr. O'Kinealy, Mr. H. Pedler, Mr. W. H. Pickering, Mr. Pearre, Mr. J. Wilson, Mr. R. W. Williamson, and others.

The minutes of the last meeting were read and confirmed.

Thirty-five presentations were announced.

The Chairman announced that Mr. I. H. Burkill had been re-elected a member of the Library Committee during the year.

The General Secretary read the following resolutions of the Sub-Committee appointed by Council to frame new rules for lending out manuscripts.

Loans to India.

Resolved :—

1. No manuscript shall be lent out to any member or non-member without the recommendation of one of the Philological Secretaries.

The loan of a manuscript or manuscripts to non-members must receive the sanction of Council in addition to the recommendation of the Philological Secretary.

In the case of non-members a security may be demanded.

2. As a rule the number of manuscripts which a member is

entitled to borrow shall be limited to two, but this number may be exceeded on the recommendation of the Philological Committee.

3. Every loan shall be reported to the Council.

4. All manuscripts lent must be returned at the end of three months.

5. With regard to Editors each individual case will be dealt with on its own merits.

The conditions under which each editor may borrow manuscripts will be forwarded with his letter of appointment.

Loans to Europe.

1. Loans cannot be made to private individuals but only to Corporate Bodies.

2. Loans to Corporate Bodies in Europe must receive the sanction of the Council.

3. The loan is to be made in the first instance for six months only, and renewals of loan for periods of three months only.

4. With each manuscript lent a form will be sent in duplicate, and three forms of application for renewal: one form will be retained by the borrower and the other duly signed by him returned to the Society.

5. That the Corporate Body to whom the loan is made will not be at liberty to allow the manuscript to leave their premises.

General Rules.

6. Certain manuscript of special importance or rarity shall be placed by the Philological Secretaries in consultation on a reserve list. These manuscripts will be marked in the Library Catalogue with asterisks, and, as a general rule, shall not be lent out of the Society's rooms.

7. It is, however, at the discretion of the Council, in very special cases, to sanction the loan of such manuscript.

Form of Acknowledgment.

We have to acknowledge receipt of...............No............... in good order and condition, to be held in trust for the Asiatic Society of Bengal and not to be removed from our premises.

We hereby undertake either to return the said manuscript by the...............(the date being six months from the date of presumable arrival) or to make a formal application for renewal of the loan by the...........(five months from the time of presumable arrival), and we further undertake to return the manuscript in the same order and condition securely packed by insured parcel post by the............ if previous sanction to retain it for a further period has not been received by the...............

Form of Application for Renewal.

We have acknowledged the receipt of........No..............on the.......... The manuscript has been used for......... . months.

The manuscript is wanted for a further period of three months, and we shall be obliged by the Society's sanction of this renewal.

Mr. E. R. Watson, proposed by Mr. D. Hooper, seconded by Dr. N. Annandale; Mohamed Hossain Khan Midhut, proposed by Dr. E. D. Ross, seconded by Mr. J. Macfarlane; Mr. K. Marsden, proposed by Dr. E. D. Ross, seconded by Mr. J. Macfarlane; Mr. J. Wilson, proposed by Mr. T. H. Holland, seconded by Dr. E. D. Ross; were ballotted for and elected Ordinary Members.

Dr. N. Annandale gave an exhibition illustrating the use of the blow-gun in Southern India and Malaya.

Mr. T. H. Holland gave a lecture on recent earthquakes in India (lantern demonstration).

The following papers were read :—

1. *Earth Eating and the Earth-eating habit in India.—By* D. HOOPER and H. H. MANN.

This paper will be published in the *Memoirs.*

2. *Formation of New Castes.—By* R. BURN, I.C.S.

3. *Notes on the Fauna of a Desert Tract in Southern India, I and II—By* N. ANNANDALE, D.SC.

This paper will be published in the *Memoirs.*

4. *Ascaris* ***halicoris*** BAIRD.—By Dr. v. Linstow. *Communicated by* N. ANNANDALE.

5. *Animals in the Inscriptions of* ***Piyadasi.—By*** MONMOHAN CHAKRAVARTI.

This paper will be published in the *Memoirs.*

LIBRARY.

The following new books have been added to the Library from October to December, 1905.

Annandale, Nelson, and **Robinson,** Herbert C. Fasciculi Malayenses. Zoology. Part I., *etc.* Anthropology. Part I., *etc.* *London, New York, Bombay,* 1903, *etc.* 4°.

Presd. by Dr. N. Annandale.

Arnold, E. Vernon. Vedic Metre in its historical development. *Cambridge,* 1905. 8°.

BATAVIA.—*Department van Landbouw.* Het bestellen van Katoenzaden uit Amerika. *Batavia,* 1905. 8°.

Presd. by the Botanic Institute of Buitenzorg.

Bell, C. A. Manual of Colloquial Tibetan. *Calcutta,* 1905. 8°.

BENGAL DISTRICT GAZETTEERS. *Calcutta,* 1905, *etc.* 8°.

Presd. by the Government of Bengal.

BHAGAVADGITA. Die Bhagavadgîtâ aus dem Sanskrit übersetzt mit einer Einleitung über ihre ursprüngliche Gestalt, ihre Lehren und ihr Alter von Richard Garbe. *Leipzig,* 1905. 8°.

Blochet, E. Études de grammaire pehlvie. *Paris,* [1902.] 8°.

Bowrey, Thomas. A Geographical Account of Countries round the Bay of Bengal, 1669 to 1679....Edited by Lt.-Col. Sir R. C. Temple. *Cambridge,* 1904. 8°.

Hakluyt Society's Publications, 2nd Series, No. XII.

Presd. by Government of India, Home Department.

Bradley-Birt, F. B. The Story of an Indian Upland...With... illustrations and a map, *etc.* *London,* 1905. 8°.

Butterworth, Alan, and **Venugopaul Chetty,** V. A Collection of the Inscriptions on Copper-plates and Stones in the Nellore District. 3 pts. *Madras,* 1905. 8°.

Presd. by the Govt. of Madras.

Caspari. A Grammar of the Arabic Language, translated from the German...and edited...by W. Wright. Third edition, revised by W. Robertson Smith and M. J. de Goeje. 2 vols. *Cambridge*, 1898. 8°.

CANADA.—*Dept of the Interior.* Statistics of the Dominion of Canada. [With resource map.] [*Ottawa*, 1905.] 8°.

Presd. by Dept. of the Interior, Canada.

Collins, F. Howard. Author and Printer. A guide for authors, editors, printers, correctors of the press, compositors, and typists...Second impression. *London*, 1905. 8°.

Copeland, Edwin Bingham. I. The Polypodiaceæ of the Philippine Islands. II. New species of Edible Philippine Fungi. *Manila*, 1905. 8°.

Bureau of Govt. Laboratories, Manila, No. 28.

Presd. by the Bureau.

Crawley, Ernest. The Mystic Rose. A study of primitive marriage. *London*, 1902. 8°.

Dingelstedt, Victor. East and West. [*Edinburgh*, 1905.] 8°.

Reprinted from the Scottish Geographical Magazine.

Presd. by the Author.

Doughty, Charles M. Travels in Arabia Deserta. 2 vols. *Cambridge*, 1888. 8°.

Elphinstone, Mountstuart. The History of India. The Hindu and Mahometan periods...With notes and additions by E. B. Cowell...Ninth Edition. *London*, 1905. 8°.

Foucher, A. Étude sur l'iconographie bouddhique de l'Inde d'après des textes inédits. *Paris*, 1905. 8°.

Bibliothéque de l'École des Hautes études. Sciences Religieuses. Vol. 13, pt. 2.

Giles, Herbert A. An Introduction to the history of Chinese Pictorial Art...With illustrations. *Shanghai*, 1905. 8°.

Gibson, Margaret Dunlop. Catalogue of the Arabic MSS. in the Convent of S. Catharine on Mount Sinai. *London*, 1894. 8°.

Studia Sinaitica, No. III.

Glade, Alfredo F. Proyecto de una estacion de segunda clase. *La Plata*, 1904. 8°.

Presd. by the Universidad de La Plata.

Glaser, Eduard. Suwâ ' und al—'Uzzâ und die altjemenischen Inschriften. *München*, 1905. 8°.

Presd. by the Author.

González, Carlos. Proyecto de puente de mamposteria. *La Plata*, 1904. 8°.

Presd. by the Universidad de La Plata.

Hertz, Gerald Berkeley. The Old Colonial System. *Manchester*, 1905. 8°.

Publications of the University of Manchester Historical Series, No. 3.

Presd. by the University.

Hosten, H. Dolmens et Cromlechs dans les Palnis. *Bruxelles*, 1905. 8°.

Extrait des "Missions Belges de la Compagnie de Jésus."

Presd. by the Author.

Jong, S. W. K. de. Het Drogen van Cocabladeren. *Batavia*, 1905. 8°.

Presd. by the Botanic Institute of Buitenzorg.

Krause, Arthur. Die Pariavölker der Gegenwart. Inaugural—Dissertation, *etc*. *Leipzig*, 1903. 8°.

Lawson, *Sir* Charles. Memories of Madras. *London*, 1905. 8°.

Lepesqueur, Parfait-Charles. La France et le Siam. *Paris*, 1897. 8°.

Presd. by the Société Academique Indo-Chinoise de France.

Le Strange, G. The Lands of the Eastern caliphate, Mesopotamia, Persia, and Central Asia from the Moslem Conquest to the time of Timur. *Cambridge*, 1905. 8°.

Cambridge Geographical Series.

Lewis, Gilbert N. I. Autocatalytic decomposition of Silver Oxide. II. Hydration in Solution. *Manila*, 1905. 8°.

Bureau of Govt. Laboratories, Manila, No. 30.

Presd. by the Bureau.

Lokāchārya, *Sri,* and **Varadaguru,** *Sri.* Tattvasekhara. By Sri Lokāchārya. Edited by K. K. V. S A. Rāmānuja Dās of Kánchî and Tattvatrayachulukasangraha by Kumara Vedantacharya Sri Varadaguru, edited by Acharya Bhattanathaswamy. *Benares,* 1905. 8°.

Benares Sanskrit Series, No. 106.

Lönnberg, Einar. Peter Artedi. A bi-centenary memoir written on behalf of the Swedish Royal Academy of Science... Translated by W. E. Harlock. *Upsala. Stockholm,* 1905. 8°.

Presd. by the Academy.

Low, Lyman H. Collections Lyman H. Low, Jac N. van Gelder et d'un amateur anglais. Monnaies et médailles de l'Amérique, de l'Asie, de l'Afrique et de l'Australie. [*Amsterdam,* 1905.] 8°.

Presd. by Herr J. Schulman.

Malcolm, Napier. Five years in a Persian Town. *London,* 1905. 8°.

Miguez, Adrian Pereyra. Proyecto de edificio para facultad de ingenieria. *La Plata,* 1904. 8°.

Presd. by the Universidad de La Plata.

Mirza Huseyn, *of Hamadán.* The Tárikh-i-Jadid or new History of Mírzá 'Ali Muḥammad the Bab...Translated from the Persian...by Edward G. Browne. *Cambridge,* 1893. 8°.

Mitra, Sarat Chandra. A few Bihari folklore parallels. The Singing games of Bihar. The Identity between a Panjabi and a Bengali accumulation droll. Note on a new type of Indian folktales, *etc.* *Bombay,* 1903. 8°.

From the Journal of the Anthropological Society of Bombay.

———. An ancient Indian drama of the tenth century A.D. [*Calcutta,* 1903.] 8°.

———. Bihari life in Bihari nursery rhymes. [*Calcutta,* 1903.] 8°.

———. Bihari life in Bihari riddles. [*Bombay,* 1905.] 8°.

From the Journal of the Anthropological Society of Bombay.

———. Further notes on Rain-compelling and Rain-stopping Charms. [*Bombay,* 1905.] 8°.

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Mitra, Sarat Chandra. Note on Clay-eating as a racial characteristic. [*Bombay*, 1905.] 8°.

From the Journal of the Anthropological Society of Bombay.

———. Note on the Egyptian origin of an incident in Indian folktales. [*Bombay*, 1905.] 8°.

From the Journal of the Anthropological Society of Bombay.

———. On the Bihari custom of placing expiations on the crossways. [*Calcutta* 1905.] 8°.

———. Sun-worship in Bihar. [*Calcutta*, 1904.] 8°.

Presd. by the Author.

Muḥammad B. al-Hasan B. Isfandiyar. An abridged translation of the History of Ṭabaristán...based on the India Office MS. compared with two MSS. in the British Museum, by Edward G. Browne. *London*, 1905. 8°.

E. J. W. Gibb Memorial, Vol. II.

Presd. by Mr. Bernard Quaritch.

Murray, John. A Handbook for Travellers in India, Burma and Ceylon...Fifth edition. *London*, 1905. 8°.

Nevill, H. R. Sitapur. *Allahabad*, 1905. 8°.

District Gazetteers of the United Provinces of Agra and Oudh, Vol. XL.

Presd. by the Government of India, Home Department.

NOBEL FOUNDATION. Code of statutes. *Stockholm*, 1901. 8°.

Presd. by Kungl. Vetenskaps-Akademie.

Rapson, E. J. Indian coins and seals. Pt. VI. [*London*, 1905.] 8°.

From the Journal of the Royal Asiatic Society, October 1905.

———. On the alphabet of the Kharoṣṭhē documents. *Paris*, 1905. 8°.

Extrait du tome I des Actes du XIVe Congrès International des Orientalistes.

Presd by the Author.

Ramsay, W. Decomposition of water by radium. *Upsala, Stockholm.* 1905. 8°.

Meddelanden från K. Vetenskapsakademiens Nobelinstitut Band I., No. 1.

Presd. by the Academy.

Rathgen, Friedrich. The Preservation of Antiquities...Translated...from the German, *etc.* *Cambridge*, 1905. 8°.

Rawlinson, George. The Sixth Great Oriental Monarchy or the Geography, History, and Antiquities of Parthia, *etc.* *London*, 1873. 8°.

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34. *An Examination of the Nyāya-Sūtras.*—*By* HARAPRASĀD ŚĀSTRI.

Anyone who carefully reads the Nyāya Sūtras will perceive that they are not the work of one man, of one age, of the professors of one science, or even of the professors of one system of religion. It would seem apparent that at different ages philosophers, logicians and divines have interpolated various sections into an already-existing work on what we may, for the want of a better term, call Logic.

It is evident that such a book would be full of contradictions, inconsistencies and irreconcilable passages. So the Nyāya Sūtras are. The Hindu Commentators from Vātsāyana, in the third century A.D. to Rādhāmohan Gosvāmī in the nineteenth, have attempted to evolve a harmonious system of Logic and Philosophy from the Sūtras. The task is an impossible one, and so every one of them has failed, and that miserably. They have imported later and more modern ideas into the commentaries, but without success. The acute logicians of Bengal thought it was a difficult work; and they had recourse to various shifts to explain the Bhāṣya and other commentaries. They have changed some passages and imported extraordinary meanings into others.

But unfortunately the idea of studying the Sūtras by themselves did not occur to any one of them. Ninety-nine per cent. of the manuscripts of this work are accompanied with some commentary or other. Manuscripts giving the Sūtras only are extremely rare. I got one from Midnapore, and gave a copy of it to my friend Dr. Venis, and it was published at Benares. It is known as the Nyāyasūtroddhāra. My friend Paṇḍit Vindhyeśvarīprasāda Duve got one at Benares, and he published it in the Bibliotheca Indica as an appendix to his edition of the Nyāyavārtika. This is known as Nyāyasūcinibandha. But from what I know of the habits of paṇḍits, I am sure nobody has studied the Sūtras by themselves. They have been used only as works of reference.

I took up the Nyāyasūcinibandha for independent study. On comparing the Sūtras as given there with Sūtras in editions accompanied by commentaries, and also with the Nyāyasūtroddhāra, I was struck with the variety of readings which the Nyāya Sūtras presented. A number of Sūtras are regarded as spurious. The readings of a large number of Sūtras are irreconcilably different in different editions. This is not the case with the Vedānta Sūtras, and with the Mīmāṃsā Sūtras, in which various readings are extremely rare, almost non-existent, and interpolated Sūtras there are none. I am not speaking of the Sāṃkhya and Yoga Sūtras, which are comparatively modern. The difficulty which I feel in regard to the Nyāya Sūtras was also felt about a thousand years ago, when Vācaspatimiśra, who flourished about the end of the tenth century, twice attempted to fix the number of Sūtras and their readings, namely, in Nyāyasūtroddhāra, and in Nyāyasūcinibandha, both of which go by his name. If both are the works of one man, as they profess to be, it is apparent that the author did not feel sure of his ground.

For convenience sake, I took up the Nyāyasūcinibandha dated 898 Saka, *i.e.*, 976 A.D., and that for three reasons, —(1) because it counts the number of Sūtras, number of words, and even the number of letters in the Nyáya Sūtras; (2) because it divides the Sūtras into sections, each dealing with a single topic; (3) and because it is dated, and there are internal evidences to show that it was written by the great Vācaspati, the commentator on the six systems. I have made an English translation of the Sūtras with as little help from the commentaries as possible.

The study of the Sūtras makes it apparent that works of two different sciences have been mixed up. One is a work on Logic, or rather the science of Reasoning, or, as Sadajiro Sugiura terms it, "science of discriminating true knowledge from the false"; and the other is a work on some system of philosophy. The work on Logic is confined almost exclusively to the first and the fifth chapters. I say almost, because some sections of the second chapter also may belong to the Logic part. The rest of the work with about eight Sūtras in the first chapter belong to the philosophical part.

Let us analyse the Logic section. This section seems to contain three separate treatises. The first chapter, with the exception of the Sūtras mentioned above, constitutes the first and the most important treatise. It is complete in itself. The first Sūtra enumerates the sixteen topics essential in Debate, and all the sixteen topics are fully treated of in the first chapter. It is fully self-contained, and nothing farther is needed to complete it. The first Sūtra gives, so to say, the objects and reasons for the science. It says that anyone who has a complete knowledge of the sixteeen topics attains the highest proficiency in every walk of life, and the first chapter deals with the complete knowledge of all the sixteen topics.

I may remark in passing that the science embodied in the first chapter of these Sūtras is not Logic, in the present signification of the term, but Logic in its primitive and rudimentary stage. It may better be called the Science of Debate. And all the requisites of a well-regulated Debate are included in the sixteen topics. They are not always the requisites of the science of Logic, as known at present. The second treatise on Logic, embodied in the Sūtras, is the first "daily lecture" of the fifth chapter. The last Sūtra of the first chapter simply says that Jātis and Points of Defeat are many, thus leaving no room for any elaborate subdivision of these two topics. But the first lecture of the fifth chapter not only enumerates twenty-four subdivisions of the Jātis, but gives careful definitions of every one of them. The author who wrote the first chapter is not the author of the first Lecture of the fifth chapter. The last section of the first lecture of the fifth chapter, which has nothing to do with definitions of the subdivisions of Jātis, but which limits the extent of a fruitless Debate, is no part of the second treatise, and seems to be an addition. The third treatise consists of the second "daily lecture" of chapter fifth. It enumerates the various Points of Defeat and defines them.

One of the most cogent reasons for considering these treatises as separate, and also for considering them to be composed by different authors, is the fact that the same technical terms have been used and defined in all the three, but in very different senses. The Definition of Jāti, as given in the first, does not cover all the subdivisions enumerated in the second. The terms *prakaraṇasama* and *sādhyasama* are defined among the "Semblances of Reason" in the first treatise, but these two have been differently defined as subdivisions of Jātis. The term *matānujñā* has been defined one way in the second and another way in the third. If all the three had been written by one and the same person, the same technical terms would not receive at his hands two such wide definitions.

It is difficult to say whether the composition of the second and third treatises preceded or followed that of the first treatise, which is a comprehensive work on the Science of Debate. Many scholars hold that such comprehensive treatises generally follow separate and partial treatises on parts, just as the uṇādi-sūtras and the gaṇa-sūtras preceded Paṇini, and that these separate treatises after the composition of the comprehensive treatise, formed its appendices.

One would be tempted to believe that all the sections of the first lecture of chapter second, with the exception of the last, and the first and last sections of the second Daily Lecture of that chapter, may be included in the Logical part, because they have a direct bearing on pramāṇa or the instruments of true knowledge, which forms the first essential topic in the Science of Debate.

The commentators and modern paṇḍits, in order to make this incoherent collection of Sūtras a harmonious whole, are obliged to say that the Nyāyasūtras consist of the enumeration, the definition and the examination of the sixteen topics. The enumeration is complete in the first Sūtra, the definition in the first chapter, and the examination in the other chapters. There would have been no cause of complaint if all this were a fact. The examination is, however not complete. It does not comprehend all the sixteen topics. The topics examined in fact are the 1st, 2nd, 3rd, 15th, and 16th. The examination of others have been altogether omitted. If there is any, it is of a very nebulous character. So a complete examination of the sixteen topics is not to be found in the Sūtras, and this is exceedingly suspicious. The examinations are, as a rule, examinations of the definitions given in Chapter I., at least so the commentators say. If so, the examination of Jāti and of the Points of Defeat are not really the examination intended by the commentators. On the other hand, in the case of Jāti, we find that the definition as given in Chapter I., depending simply upon homogeneity and heterogeneity, does not apply to a number of the subdivisions of Jātis as given in Chapter V. The examination of other three topics, too, contains so much of heterogeneous matter, besides an examination of the definition, that one is tempted to say that the whole of the examination affair, *i.e.*, all the chapters II. to IV. are an addition. So far about the Logic portion.

The Philosophy portion has its beginning in the second Sūtra of the first chapter. The first Sūtra of Chapter I., as has been already said, gives the objects and reasons of the work. And these objects and reasons seem to be all secular. There was no need for a second enunciation of the objects and reasons. But the second Sūtra again enunciates them. And in this case, they are philosopical and spiritual. Vācaspatimiśra puts the two together in one section, and calls the section "objects and reasons." The commentators have tried to reconcile this double enunciation of objects and reasons, but without success. The only reasonable explanation of this double enunciation seems to be that some later writer has interpolated the second Sūtra with a view to add philosophical sections to the work. The second Sūtra contains topics which are not enumerated in the first, and the thoughtful reader is struck with the introduction of new matter so early as in the second Sūtra. These topics are misery, birth, activity and fault together with "apavarga." The introduction of these new topics is defended by saying that they fall under the subdivisions of the second topic, in the first Sūtra, namely, "objects of true knowledge." "The object of true knowledge" is a topic which is so vast that all the topics of the world may come under its subdivisions. And, as a result of this, the interpolator has tampered with the definition of prameya (Sūtra I. 1·9) which is virtually an enumeration of its subdivisions, and put in five new topics into it. That the prameyasūtra at one time was different from what it is now, is apparent from the statement of Haribhadrasūri, a Jain writer, who in his ṣaḍdarśana samuccaya describes the prameyasūtra in the following terms :—

प्रमेयं ह्यात्मदेहाद्यं बुद्धीन्द्रियसुखानि च, (Bibliotheca Indica edition), or, as in the Benares edition, **प्रमेयं ह्यात्मदेहार्थं बुद्धीन्द्रियसुखानि च.** The order of words is different; sukha or happiness seems to have been included in the old prameyasūtra Sukha finds no place in that Sūtra now and in Chapter IV., Âhnika I., the Section 13 on the examination of duḥkha, reduces sukha into duḥkha, and is not prepared to admit sukha as a separate subdivision of prameya. But from Haribhadra's statement we find that sukha was there at some early time. Now the question is, who changed the Sūtras and why? The answer is not far to seek. In a work on Logic prameya, as a topic, must come in. But Logic does not require a long enumeration of prameyas and an elaborate examination of their details, which are essential in philosophy. So the author who wanted to convert a logical treatise into a system of philosophy, and who is responsible for the interpolation of the second Sūtra is also responsible for this alteration in the prameyasūtra The logical treatise was an ancient Hindu treatise, and Hindus never took an ultra-pessimistic view of the world. Sukha is the ultimate goal of the Mīmāṃsakas; of the

Vedāntins, the two really orthodox systems of Hindu philosophy. Why should Nyāya be so pessimistic? There is no reason for it, and it has been shown that the word sukha did at one time occur in the prameyasūtra. The Buddhists are downright pessimists. To them everything is duḥkha, and it is they who believed that sukha was, if properly analysed, duḥkha. It seems that the Hindu logical treatise underwent the first stage of its philosophical transformation in the hands of some Buddhist philosopher, and became a gloomy and pessimistic science. The second Sūtra of the first chapter, destroying so many things successively and reaching to apavarga, has the appearance of Buddhistic teaching. They enumerate a long series of effects from false knowledge, and teach us that as we destroy effects, we perceive the causes, that these causes are also effects; we destroy them and gradually we come to the original cause of all these, namely, false knowledge; when that is destroyed we come to nirvāṇa. This is precisely the teaching of the second Sūtra, though the enumeration is not so long. The Buddhist tradition, as we know it from China and Japan, distinctly says that the Logic of Akṣapāda was their handbook in logic, and that they added to and subtracted from it. The tradition is positive that Mirok mixed up Nyāya and Yoga, and we find in the present Nyāyasūtra a long section on Yoga in IV. 2, and one is puzzled to know why it has been introduced. The grounds advanced by Hindu commentators for its introduction are of the flimsiest kind. But the fact comes from China that Mirok mixed the two up. So some other Buddhist philosophers might have introduced the second Sūtra and changed the prameyasūtra so as to suit his purpose.

That the science of Akṣapāda was, for a long time, in the hands of the Buddhists, and, therefore, not in great favour with the Brāhmanist, will appear from .the following considerations. The Rāmāyaṇa, the Mahābhārata, the Purāṇas, and even the Dharmaāśtras dislike those who studied the Tarkaśāstra. The Vedantasūtras distinctly say that this science was not accepted by the orthodox. They are known as little removed from the Buddhists—the Buddhists are nihilists, they are half nihilists (ardhavaināśika). That there was an unholy alliance between the Nyāya and the Buddhists in the early centuries of Buddhism, is not open to grave doubts. The introduction of the second Sūtra, the alterations in the prameyasūtra, and the definitions of misery, birth or rebirth, activity, faults, and emancipation in the first chapter appear to be the work of Buddhists. The examination of these definitions occupy the whole of the first Lecture of the fourth chapter.

The work underwent another transformation in the hands of a later Hindu sect who vigorously assailed some of the prominent Buddhist doctrines, both Mahāyānist and Hīnayānist. These assailed Sarvadśūnyatāvāda on the one hand, and Sarvāstvāda on the other. To know who they were not, one has simply to cast his eyes on the various theories that have been assailed in connexion with the examination of rebirth. These are

शून्यतोपादान, ईश्वरोपादान, आकस्मिकत्व, सर्व्वानित्यत्व, सर्व्वनित्यत्व, सर्व्वपृथक्त्व, सर्वशून्यता, संख्यैकान्तवाद। But this gives us no clue to the identification of the sect, save and except that they were non-Buddhists. Haribhadra, however, tells us that these were S̄aivas and Haribhadra belongs to the fifth century of the Christian era.

Haribhadra's statement is borne out by two facts. Sūtra 8, Chapter I., seems to be out of place. The pramāṇas are defined in the four previous Sūtras, and, all of a sudden, comes a Sūtra subdividing śabda; subdivisions of śabda are unknown in other systems of philosophy. It is generally translated by the word, "dogma." The distinctions between the Revealed Word and the Ordinary Word is peculiar to the Nyāyasūtras. It is not Buddhistic, because they did not know of this subdivision. And in the fifth century, they discarded dogma altogether. Moreover, the introduction of this Sūtra explains the introduction of the section, on the authority of the Vedas, and along with it, of a quarrel with the Mīmāṃsakas on the eternity of sound.

All this seems to be the work of a Hindu sect which we take to be the S̄aivas at the instance of Haribhadra. These are a compromise between the Hindus and the Buddhists.

So the present Nyāyasūtras consist of three treatises on Logic. And the bit of Hindu systems of philosophy that it contained has been mixed up with two other systems of philosophy, which have been laterly interpolated into the book.

Even after a careful examination, I do not find the Nine Reasons and Fourteen Fallacies attributed to Akṣapāda by the Chinese authorities. There are chapters on fallacies and 'homogeneity, and heterogeneity' play an important part in the Nyāyasūtras. But yet no "Nine Reasons" and "Fourteen Fallacies." Perhaps the primitive work of Akṣapada was systematised in very early times by another person named Gotama. But this is diving too deep into the antiquity of Hindu thought, and our appliances are not sufficient for the purpose.

35. *Optimism in Ancient Nyāya.*—*By* VANAMĀLI VEDĀNTATĪRTHA.

In the interesting paper "A study of the Nyāya-Sūtras," which Mahāmahopādhyāya Haraprasāda Śāstrī read in the Asiatic Society's Meeting in November 1905, I was delighted to find him advocating, with very cogent arguments, that *the original Nyāya-Sūtras were not pessimistic.* Nowadays Nyāya Philosophy means Nyāyavaiśeṣika, and the philosophic productions of the modern Naiyāyikas are really Vaiśeṣika Philosophy in a Naiyāyika garb. The terminology and the method are Naiyāyika, but the philosophy is, nevertheless, Vaiśeṣika. Thus the pessimism of the modern Naiyāyika is due not to his Nyāya, but to his Vaiśeṣika, from which he does not know how to distinguish his Nyāya. The well-known couplet

वरं वृन्दावने रम्ये शृगालत्वं व्रजाम्यहम् ।
न तु वैशेषिकीं मुक्तिं प्रार्थयामि कदाचन ॥

makes the Vaiśeṣika salvation consist in an unconscious, pleasureless, painless existence. This is as it should be. But when Śrīhaṣa makes Gotama (otherwise called Akṣapāda) responsible for a pessimistic doctrine of salvation, he seems to have uncritically stated the common opinion of his time. Says he—

मुक्तये यः शिलात्वाय शास्त्रमूचे सचेतसाम् ।
गोतमं तमवेक्ष्यै (त्यै) व यथा वित्थ तथैव सः ॥

(Naiṣadha XVII., 75.)

The following extracts from the Saṃkṣepa-Śaṅkarajaya of Mādhavācārya will substantiate the Śaṣtri's view. It shows that even the comparatively recent Mādhava was not unacquainted with the fact that the Naiyāyika salvation was really optimistic and included an element of pleasure, though it was vulgarly identified with the Vaiśeṣika salvation. Whether the author was or was not the celebrated Mādhavācārya, the minister of the Bukka family of Vijaynagar, is immaterial to the argument. For what is contended here is that even in such a late production as the Sakṣepa Śaṅkara-jaya, which professedly is an abstract of a larger life of Śaṅkara, the Naiyāyikas are credited with an optimistic view of salvation.

तत्रापि नैयायिक आत्तगर्वः कणादपक्षाच्चरणाक्षपक्षे ।
मुक्तेर्विशेषं वद सर्व्वविच्चेन् नोचेत् प्रतिज्ञां त्यज सर्व्ववित्त्वे ॥
ऽत्यन्तनाशे गुणसङ्गतेर्या स्थितिर्नभोवत्कणभक्षपक्षे ।
मुक्तिस्तदीये चरणाक्षपक्षे सानन्दसंवित्सहिता विमुक्तिः ॥

(Saṃkṣepa Śaṅkarajaya XVI., 68–69).

Says the Naiyāyika vauntingly (to Śaṅkara): "If you are omniscient, state the difference between the theories of salvation as held by Kaṇāda and by Akṣapāda. Otherwise give up your pretensions to omniscience." (Replies Śaṅkara) "According to Kaṇāda, salvation is existence, where all connexion with attributes has been absolutely destroyed, and the soul remains like the sky. According to your Akṣapāda that salvation includes a consciousness of pleasure."

Śaṅkara, the great Advaita commentator on the Brahmasūtras, went to Śāradā-pītha in Kāśmīra, and before he could enter into the shrine, he was questioned by different philosophers on nice points of Indian Philosophy. Permission to enter was conditional upon answering these questions rightly. The two couplets quoted above occur just after Śaṅkara had successfully answered the atomic philosopher (Kaṇāda).

From what has been said, it will be evident that though *sukha* or pleasure is not enumerated as a separate prameya in Nyāyasūtra (I. 1. 9), as known at present, and though section 13 of the first āhnika of the fourth chapter reduces it to mere pain, yet it (pleasure) had a place in the old Nyāya Śāstra, and that *the true tradition* was not lost in such out-of-the-way places as the Śāradā pīṭha in Kāśmīra, and that only such great masters as Śaṅkara were expected to know it, the tradition having been lost in the mainland of India much earlier.

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36. *Some Notes on the Dates of Subandhu and Diṅ-nāga.*—*By* HARAPRASĀD S'ĀSTRI.

Since the publication of an edition of the Vāsavadattā by Edward Hall, in the Bibliotheca Indica, in 1859, the date of its author is taken to be either the end of the sixth century or the beginning of the seventh. The reason assigned by Hall for arriving at this conclusion is the fact that Bāṇa in the beginning of the seventh century mentions Subandhu as one of his predecessors.

However unsatisfactory the reason might be, the Orientalists have accepted the above date for Subandhu. The question, however, is still an open one; and here are facts which may be taken for what they are worth.

In discoursing on the excellencies of style, Vāmana, who belongs to the ninth century A.D., in his Kāvyālaṅkāra Sūtra Vṛtti, quotes a verse as an example of the excellency named Significance (sābhiprāyatva).

The verse or rather hemistich runs thus:—

"सोऽयं सम्प्रति चन्द्रगुप्ततनयः चन्द्रप्रकाशो युवा ।
जातो भूपतिराश्रयः कृतधियां दिष्ट्या कृतार्थश्रमः ।"

"The celebrated son of Candragupta, the young rājā Candrapraksa, has become the refuge of learned men, and fortunately his labours are successful."

Commenting on this the author says, that the words, "the refuge of learned men," are significant, because they bring to mind the fact that Subandhu was one of his ministers.

Now, there were two Candraguptas in the Gupta line; both were called Vikramāditya. The first was the founder of the empire and the second his grandson. The second Candragupta was a patron of learned men. Is it not likely that Subandhu served under one of his sons, Candraprakāsa?

It is an old custom among Indian sovereigns to appoint their adult sons to rule extensive territories, and these Princes used to hold courts on the model of their imperial fathers This Candraprakāsa seems to have done with Subandhu as one of his ministers.

As Candragupta's inscriptions range from 400 to 414 A.D., Subandhu must have flourished about that time, *i.e.*, in the beginning of the fifth century.

There may be an objection to this, that in some MSS. the word is not Subandhu but Vastubandhu. But there is no such name as Vastubandhu in the history of Sanskrit literature, so far as it is known. Vastubandhu may be a corruption of Vasubandhu who flourished about this time; but he was a Buddhist monk who would not accept office and would not be spoken of with favour by a Hindu writer. Vastubandhu is only, I believe, a scribe's mistake for Subandhu.

There is a passage in Subandhu's own work Vāsavadattā which seems to confirm my conclusion. In the preface to his Vāsavadattā, he regrets that on the death of Vikramāditya, new people came to the front, the old taste for poetry was gone, and everyone's hand was at his neighbour's throat. It seems that on the death of Candragupta there was a civil war, and Subandhu came to grief, by supporting a losing cause. The successor of Candragupta Vikramāditya was Kumāragupta and not Candraprakāśa.

Kern in his "Indian Buddhism" puts down Diṅnāga between 520 and 600 A.D. The Chinese think that he flourished in the tenth century of the Buddhist era, *i.e.*, between 420 and 520 A D. Tākākusu, in his paper on the date of Vasubandhu, has shown from the dotted Buddhist records left by Indian paṇdits in Chinese monasteries, that the date of Buddha's death is very nearly the same as has been arrived at by the Orientalists of Europe, *viz.*, 480. B.C.

I have got a quotation from Diṅnāga's work in Haribhadra's famous work entitled "Ṣaḍdarśana Samuccaya." He says that the definition of Pratyakṣa or perception is कल्पनापोढ़मभ्रान्त—and he also says that the Buddhists believe only in two sources of right knowledge. It is well known that Diṅnāga discarded Śabda, or dogma, from the sources of right knowledge, and fixed the number of these sources at two; and Diṅnāga's definition of Pratyakṣa is known to be कल्पनाऽपोढ़मभ्रान्तं. So the quotation is from Diṅnāga.

Haribhadra was one of the great Jaina writers whose date of death is fixed by the universal tradition amongst the Jainas, at 535 Vikrama samvat, *i.e.*, 479 A.D. The dates are given in two Prākṛta gāthās, in pp. 372 and 378, vol. iv. Peterson's Reports.

A study of Haribhadra's work confirms the idea that he belonged to about the fifth century A.D. He does not know Vedānta as a system of Philosophy. He enumerates the following as the six systems:—

Bauddha, Naiyāyika, Sāṁkhya, Jaina, Vaiśeṣika and Mimāṃsaka. But, says he, if one considers Naiyāyika and Vaiśeṣika to be one and the same system, to him the sixth would be the Cārvāka. All these stamp him as floursbing before the rise of Vedānta and Yoga. His Mīmāṃsā does not show any sign that he knew Kumārila.

If Haribhadra, before 479 A.D., quotes from Diṅnāga and adopts his view as universally accepted by Buddhists, Diṅnāga must have flourished some time before him.

Sadajira Sugiura, who writes a monograph on Hindu Logic as preserved in China and Japan, says that the name of Diṅnāga's teacher is not known. But Kern says he was a pupil either of Asaṅga or of Vasubandhu—two brothers who distinguished themselves as Mahāyānist writers. Tākākusu places Vasubandhu in the reign of Skandagupta, and his son Bālāditya in the seventies and eighties of the fifth century A.D. This, I think, is untenable. Tākākusu makes two initial mistakes: (1) Skandagupta is not Vikramāditya but Kramāditya; and (2) he was not succeeded by Bālāditya but by Pura Gupta.

If we take the Vikramāditya mentioned by Tākākusu to be Candragupta, who is really called Vikramāditya in his coins, and Bālāditya for his heir-apparent Kumaragupta, then the account by Tākākusu and that by Haribhadra can be reconciled. Bālāditya is not a proper name: it simply means "the young Sun," the heir-apparent. If this view of the thing is accepted, Diṅnāga, the pupil either of Vasubandhu or of Asaṅga, would write his books in the first quarter of the fifth century; and by the time Haribhadra wrote, they would be well-known works.

Candragupta Vikramāditya seems to have had two sons—Candraprakāśa and Bālāditya; of these Bālāditya favoured the Buddhists and succeeded to the throne, while Candraprakāśa was worsted in civil war and his minister Subandhu complained that "new men" came to the front, the old taste for poetry was gone, and everyone's hand was at his neighbour's throat.

37. *Formation of New Castes.—By* R. Burn, I.C.S.

An interesting example of the constant movement going on among Hindu castes has recently been brought to my notice. Among the numerous endogamous groups included in the term Vaiśya or Baniā are two known as Bārahsenī and Chausenī, the members of which are chiefly found in the Central Doāb. The former claim descent from the Chandravanśī King Brasṇī, while one account of the latter traces their origin to Chānūṛ, a wrestler attached to the Court of Rājā Kans who was slain by Kriṣṇa. There seems little doubt that neither group is in reality of any considerable antiquity. While the Bārahsenīs are shopkeepers and frequently confectioners, they were, till recently, only allowed to sell articles made up of milk and curds, such as *pera*, *barfī*, etc., and not sweetmeats containing flour or grain such as *puri* and *halwā*. The Chausenīs are usually regarded as a class composed of illegitimate children of Bārahsenīs or outcastes from that group.

Two events have, however, recently happened which show that the Chausenīs are rising in importance and now object to receive recruits in the usual manner. The Hindu Bārahsenīs have already reached the stage at which widow remarriage is no longer recognized. Some members have, however, joined the Āryā Samāj, and a marriage was lately celebrated between a Bārahsenī man and a widow of the same group. When the project was announced, the orthodox Hindus held a meeting and endeavoured to stop further proceedings, but without success. Two days after the marriage another meeting was held, and the married couple and those who aided them were solemnly excommunicated. A printed notice has been widely circulated directing all Bārahsenīs to avoid dining, marrying, drinking or holding any communication with those outcasted. A large feast was subsequently held, at which about 4,000 orthodox Bārahsenīs were present, but to which none of the guilty members were invited. The feeling has gone so far that some men whose sons had previously married into families now outcasted have recalled their daughters-in-law, and refuse to let them visit their parents. Others have turned their own daughters out of their houses as they are married to outcastes.

The other case differs in nature. A Bārahsenī, *A*, has a daughter who was married to *B*. *B* abandoned his wife and kept a Musalmān woman by whom he had several children, and it was thought that he had become a Musulmān. He recently came to *A* and claimed his wife, and was entertained by his father-in-law. *A* has, therefore, been outcasted, and was not invited to the caste feast which celebrated the expulsion of those concerned with the remarriage of a widow.

The question now arises, what is to become of the persons outcasted? Up to a recent date they would have been received by the Chausenīs. This group, however, refuses to admit them, as an important section of it has refused to recognize widow marriage, and even the rest of the group look on the practice with growing disfavour. The outcastes in the first case themselves refuse to be considered as Chausenīs on the ground that the widow remarriage took place between persons of the same caste, while degradation is only effected where a connection takes place between members of different castes. The Chausenīs refuse to accept *A* and *B*, because they hold that the contact with Musalmāns has rendered them unfit for any relations. So far, no final decision has been arrived at, and the result is that the excommunicated persons are regarded as having no caste at all. It is not improbable that the persons turned out for their connection with the widow remarriage will form a separate group.

38. *Ascaris halicoris* BAIRD.—By DR. V. LINSTOW. *Communicated by* N. ANNANDALE.[1] (With 1 plate).

Aus der Pars pylorica des Magens von *Halicore dugong* Quoy & Gaim. Golf von Manaar.

Owen, *Catalogue of the Physiological Series of Comparative Anatomy*, London, 1833.

Owen, *Proc. Zool. Soc*, London, VI., 1838, p. 30.

Baird, *Proc. Zool. Soc.*, London, XXVII., 1859, pp. 148–149, tab. lvi, figs. 2–2*c*.

Parona, *Annal. Mus. Civic. Genova*, 2 ser., VII., Genova, 1889, pp. 751–761, fig. 1–3, tab. xiii, figs. 1–16.

Stiles u. Hassall, *Intern. Paras. of the Fur Seal*, Washington, 1899, pp. 147–151, figs. 70–75.

Aus dem Magen von *Halicore dugong;* Penang, Rothes Meer, Assab.

Die Art hiess früher *Ascaris halicoris* Owen, aber OWEN's Bezeichnung vom Jahre 1833 ist ein blosser Catalog-Name ohne jede Beschreibung; auch im Jahre 1838 sagt er nur: "*in each case the gland* (des Magens von *Halicore dugong*) *was infested by Ascarides, hereafter to be described*"; er hat aber eine solche Beschreibung nicht gegeben.

Die erste Beschreibung, auch unter dem Namen *Ascaris halicoris*, stammt von BAIRD, der die Länge des Männchens auf 63·5 mm, die des Weibchens auf 82·5 mm. angiebt, und die Vulva des Weibchens in $\frac{3}{8}$ der Körperlänge vom Kopfende findet.

Eine eingehendere Beschreibung lieferte erst PARONA; er giebt an, dass das Männchen 85–115 mm. lang ist, am Schwanzende stehen jederseits 4 prae– und 1 post-anale Papille und die Spicula sind kurz; das Weibchen hat eine Länge von 85–144 mm. und eine Breite von 3·5 mm; die Vulva liegt an der Grenze vom 1. und 2 Drittel des Körpers; die Vagina ist 6·5 mm., die Uteri sind 29 mm. lang; eine blinddarmartige Verlängerung des Darms verläuft nach vorn neben dem Ösophagus und hat $\frac{11}{17}$ der Länge desselben; PARONA giebt Durchschnitte der Körperwandung mit der Muskulatur, dem Dorsalfeld und dem Lateralfeld, letzteres mit dem in ihm verlaufenden Excretionsgefäss, Durchschnitte der 3 Lippen, des Ösophagus, des Darms, des Blinddarms, des Ovarium, des Uterus und des Hodens.

STILES und HASSALL haben die Art nicht untersucht; sie referiren über die Beschreibungen BAIRD's und PARONA's, und reproduciren einen Theil der Abbildungen derselben.

PARONA's Schilderung kann ich mehrfach ergänzen und die Exemplare, welche meinen Untersuchungen zu Grunde lagen

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[[1] Dr. von Linstow has been kind enough to send me the accompanying note on the Round Worm of the Dugong. It appears that no communication has previously been published in German by the Asiatic Society of Bengal; but it has been felt that the work of so distinguished an authority should be issued exactly as it was received. No student of the Nematodes can be ignorant of the contents of Dr. von Linstow's numerous and invaluable contributions to the literature of the group.—N. A.]

verdanke ich der Güte des Dr. N. ANNANDALE, Deputy Superintendent of the Indian Museum in Calcutta.

Die Farbe der Nematoden soll im Leben eine grünliche sein. Beide Körperenden sind verdünnt, und Kopf und Schwanzende sind abgerundet.

Die Cuticula ist in Abständen von 0·016 mm. regelmässig quergeringelt; eine gröbere, tiefere Querringelung findet sich in Entfernungen von 0·28–0·35 mm., und in den beiden Seitenlinien stehen in Intervallen von 0·79 mm. vertiefte schwarz-pigmentirte Querfurchen.

Die Leitenfelder haben eine Breite von $\frac{1}{8}$–$\frac{1}{9}$ des Durchmessers und schimmern als weisse Stränge durch die Cuticula hindurch.

Die drei Lippen sind ohne Zwischenlippen, Zahnleisten und Löffelbildung; die Dorsallippe ist 0·45 mm. lang und 0·48 mm. breit; die grösste Breite liegt etwas vor der Mitte; die Form ist gleichmässig abgerundet, die Pulpa bildet 2 rundliche Vorsprünge nach vorn, die jeder einen kleinen fingerförmigen Ausläufer nach innen, nicht weit vom Vorderrande, haben; die Papillen stehen im vorderen Drittel und sind weit nach aussen gerückt.

Der Ösophagus nimmnt $\frac{1}{7}$–$\frac{1}{5}$ der Gesammtlänge ein und ist 0·59 mm. breit; der 0·51 mm. breite Darm sendet eine blinddarmartige Verlängerung nach vorn, die an der Dorsalseite des Ösophagus verläuft und länger als die Hälfte des letzteren ist.

Das Männchen erreicht eine Länge von **115** mm., und eine Breite von 3·16 mm.; das Schwanzende, welches $\frac{1}{146}$ der Gesammtlänge einnimmt, ist ventral eingebuchtet; an demselben stehen jederseits in grossen Abständen 4 prae- und 3 post- anale Papillen; die vorderste der prae-analen steht 4·9 mm. vom Schwanzende entfernt; das 0·19 mm. breite Vas deferens schwillt 4·7 mm. vor der Cloakenöffnung zu einer spindelförmigen 0·62 mm. breiten Samenblase an; die beiden Sirren sind fast gerade, an der Wurzel knopfförmig verdickt und 1·58 mm. lang bei einer Breite von 0·079 mm. Sie verlaufen in einem Musculus protrusor, der sie mit einer Scheide rings umgiebt, und können von einem Musculus retractor zurückgezogen werden. Das dickwandige Vas deferens ist aussen gebildet von einer Ringmuskellage, an der innen ein sehr breites gekerntes Epithel steht; auch der Ductus ejaculatorius hat im Innern hohe gekernte Epithelzellen.

Das Weibchen wird 140 mm. lang und 3·95 mm. breit; das Schwanzende nimmt $\frac{1}{89}$ der ganze Thierlänge ein; die Vulva theilt die Länge von vorn nach hinten im Verhältniss von 14-29. liegt also an der Grenze von 1. und 2. Drittel. Die Vagina ist 4·75 mm. lang und 0·39 mm, breit; sie ist sehr dickwandig und lässt unter der Hüllmembran eine breite gekernte Ringmuskelschicht erkennen; dann folgt eine homogene Lage und nach innen von dieser eine breite Auskleidungsmembran mit Längsleisten. Die Vagina theilt sich in 2 Uteri, die 1·07 mm. breit sind; unter der dicken Hüllmembran liegt eine gekernte Ringmuskelschicht, innen von dieser eine granulirte Lage mit kleinen Kernen und nach innen von der letztern eine Schicht sehr kleiner hyaliner kugelförmiger gekernter Körperchen. Die Uteri verschmälern sich am Ende auf 0·24 mm. und gehen in ein gestreckt eiförmiges Receptaculum seminis von 1·78 mm. Länge und 0·59 mm. Breite über, das an seiner Innenwand rundliche gekernte Epithelzellen trägt; dann folgt eine 4·3 mm. lange und 0·24 mm. breite Tuba, welche ausser der Hüllmembran nur aus einer sehr mächtigen gekernten Ringmuskulatur besteht, und auf die Tuba folgt das 0·39 mm. breite, sehr lange, vielfach gewundene Ovarium.

Die Eier sind kugelrund und 0·13 mm. gross; die Schale ist dick und aussen dicht mit unregelmässigen Eindrücken bedeckt, die bald rundlich, bald viereckig, bald dreieckig und bald linienförmig sind.

Erklärung der Abbildungen.

Fig. 1. Dorsallippe.
Fig. 2. Männliches Schwanzende von der linken Seite.
Fig. 3. Querschnitt durch das Vas deferens.
Fig. 4. Querschnitt durch die Vagina.
Fig. 5. u Uterus-Ende; r Receptaculum seminis; t Tuba; o Theil des Ovarium.
Fig. 6. Querschnitt des Uterus.
Fig. 7. Theil eines Uterus-Querschnitts (stärker vergrössert).
Fig. 8. Querschnitt der Tuba.
Fig. 9. Theil eines Querschnitts des Receptaculum seminis.
Fig. 10. Vagina mit dem Beginn der beiden Uteri.

39. NUMISMATIC SUPPLEMENT VI.

N.B.—*The enumeration of these articles is continued from page 135 of the Journal for 1905.*

II.—MEDIÆVAL INDIA.

42. A Hoard of Rajput coins found in the Garhwal District.

The following analysis of a hoard of Rajput coins found at Lansdowne, in the Garhwāl District of the United Provinces, is of some interest, both on account of the contents of the hoard and on account of the place of its discovery.

The circumstances of the find cannot be better described than in the words of the owner, Major M. B. Roberts, 1/39 Garhwal Rifles. In a letter to the British Museum, dated 29th May, 1905, he says:—

"The following is the history of the finding of these coins: ……… …… My Regiment is permanently stationed at Lansdowne (a cantonment which came into existence on 4th November, 1887) in the Garhwāl District of the United Provinces of Agra and Oudh (late North-Western Provinces). The station is situated on the outer range of the Himalayas between 5,000 or 6,000 feet above sea level, and lies just about half-way between Naini Tāl and Mussoorie. The district is populated for the most part by Rājputs, who were supposed to have immigrated there from Rājputāna at various periods up to about 1,000 years ago, I believe. On the 22nd October last, whilst having a building site for my house excavated on the top of the ridge, a number of these coins, all exactly alike, were discovered buried in a small earthenware pot about two feet below the surface. Unfortunately the earthenware pot was broken into minute fragments by the pickaxe."

The coins were 157 in number; they were of copper, often showing traces of silverplating, and they were all of the well-known Rājput types "the bull and horseman." They are distributed as follows:—

Tomāra Dynasty of Dehli and Qanauj.

	No.
Sallakṣaṇa-Pāla Deva, A.D. 978-1003.[1] (*v.* Cunningham, *Coins of Mediæval India*, page 88, Pl. IX. 1) … … …	5
Anaṅga-Pāla Deva, A.D. 1049-1079. (*ibid.* page 85, Pl. IX. 4 and 5) … …	6

Rāhtor Dynasty of Qanauj.

Madana-Pāla Deva, A.D. 1080-1115. (*ibid.* page 85, Pl. IX. 15) … …	39

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[1] The dates given are those of Cunningham.

Chauhān Dynasty of Ajmir and Dehli.	
Someśvara Deva, A.D. 1162-1166. (*ibid.* page 86, Pl. IX. 9)	21
Rājpūts of Narwar.	
Chāhaḍa Deva, A.D. 1234-1255. (Thomas, *Pathāns*, page 70, referred to but not illustrated in Cunningham, *op. cit.* page 92)	72
Coins not completely identified. (cf. Cunningham, *op. cit.* page 88)	14
TOTAL ...	157

It will be seen that the coins, which are at the same time both the most numerous and the latest in date, are those of Chāhaḍa Deva; and it is, therefore, not unreasonable to suggest that the hoard was most probably concealed during his reign.

An excellent summary of the chief events of the reign of Chāhaḍa Deva is to be found in Thomas, *Pathāns*, page 67ff. His position seems to have been that of "the recognised leader and lord paramount of the Hindu princes of Central India, struggling to preserve their kingdoms from the foreign invader" (*op. cit.* page 68). He is described in an inscription of his descendant Gaṇapati (Vikrama 1355, A.D. 1298) as the founder of a family of Rajput princes reigning at Nalapura (Narwar),[1] and his coins of the Narwar type bear dates varying from $129x$ to **1311** Vikrama (A.D. $1233+x$ to 1254)[2]; but such of his coins as occur in the persent hoard are not of the well-known Narwar type, and they would certainly seem to indicate some extension of his dominion. Ajmir would be a far more probable attribution for these coins, though the varieties of Rājpūt coinage have not yet been studied with sufficient minuteness to enable us in most cases, to determine their different localities with precision.[3] All that can be said with certainty in regard to the locality of these coins is that they do not belong to Narwar, the characteristic types of which are quite different.

As Thomas points out (page 70), the coins bearing the name of Chāhaḍa Deva represent him either (1) as an independent sovereign, or (2) as a tributary to the Muhammadan conqueror, Shams-ud-dīn Altamsh. All the seventy-two coins of his which are included in this hoard belong to the former class; and we may perhaps conclude that the hoard was buried in the earlier part of his reign before the date of his submission to Altamsh.

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[1] *Indian Antiquary*, XXII, p. 81.

[2] Cunningham, *Coins of Mediæval India*, p. 90, Pl. X. 5-7.

[3] *Cunningham* (*op. cit.* p. 91) attributes these coins to Ranthambhor. But if the chronological table given by Thomas, p. 45, is correct, Ranthambhor was captured by Altamsh in Hejira 623 = A.D. 1226; and Chāhaḍa-deva seems not to be heard of before A.D. 1234 (Thomas, p. 67).

Major Roberts has noticed the tradition which is still preserved of immigrations of the population from Rājputāna to Garhwāl. It is extremely probable that the Muhammadan conquests were one of the chief causes of such immigrations; and the hoard, which we have examined, may, therefore, be regarded as an historical record of considerable interest.

It remains only to add that, through the generosity of Major Roberts, specimens of each variety represented in the hoard have been added to the collection of the British Museum.

British Museum: E. J. Rapson.

43. IV.—MUGHAL EMPERORS.

Some rare Mughal Coins.

(i) *Akbar.*

Æ.
Weight, 306 grains.
Size, ·84 inch.
Date, 981 in Persian words.

Obverse.
دارالملک
حضرت دهلي
فلوس

Reverse.
و یک
هشتاد (*San-i-Nuhṣad hashtád wa yak*)
نهصد
سنه

Fulūs of Akbar from the Dehli Mint with the title *Hazrat* are known, but this *Fulūs* bears the full title *Dár-ul-Mulk Hazrat*, which we meet on Humāyun's *Fulūs*.

(ii)

Æ.
Weight, 154 grains.
Size, ·7 inch.
Date, 965 in Persian words.

Obverse.
فيروزه (*Zarb Fulūs*
حصار *Hiṣṣár Firoza*)
ضرب فلوس

Reverse.
تاریخ پنج شصت (*San-i-Tárikh*
سنه *Nuhsad Shasht.*)
نہصد (*wa*) *Panj*).

This *Fulūs* (hitherto unpublished) weighs 154 grains, and is therefore *half a Dām or half a Fulūs.*

There is an eight-rayed star just to the right of ف of فلوس

(iii) *Farrukhsiyar.*
Æ.
Weight, 100 grains.
Size, ·75 inch.
Mint, Bahādur garh. ?
No date.

Obverse.
فرخ سیر
فلوس

Reverse.
بهادر گره ؟
ضرب

This is a new mint in copper of this king. As the word Bahádur is found engraven on this *Fulūs*, it is open to question whether it is (1) Bahádurgarh, (2) Bahádurpatan, or (3) Bahádurpúr. I was fortunate in getting this coin as a present from my kind friend Mr. Cowasjee Eduljee Kotwall of this place, along with some rubbings of copper *Fulūs* of the same king. On one of the rubbings I read distinctly the mint (Bah)ādurgarh.

(iv) *Jahándár Shah.*
Æ.
Weight, 166 grains.
Size, ·75 inch.
Mint, Dáru-s-Salṭanat Burhānpūr.
Date, Ahad احد

Obverse. Portions of the usual legends.
در آفاق زد سکه چون مهر و مه
ابوالفتح غازی جهاندر شه
in three lines.

Reverse.
جلوس مانوس
میمنت
سنه احد دارالسلطنت
ضرب
برهانپور

Hitherto coins are known to have been issued from the Burhānpūr Mint either without, or with one of its titles—*viz.*, *Baldat* بلدة *Baldat-i-Fākhira* بلدة فاخرة and *Dāru-s-Sarūr* دارالسرور. This *mohr* adds a new epithet to this mint.

(v) *Rafiu-d-Darjāt.*
Æ.
Weight, 170 grains.
Size, ·92 inch.
Mint, Zīnat-ul-Bulád Ahmadābād.
Date, **11**(**31**) A.H.

Obverse. Couplet in three lines thus—

زد سکه بهند با هزاران برکات
شاهنشه بحروبر رفيع الدرجات

The *Hijri* year is at the right of the top line.
١٣١١.

Reverse.

احمداباد
زينت البلاد
ضرب
جلوس ميمنت مانوس
سنة احد

I have had a rupee similar in design to this gold mohr presented by my kind friend Dr. Geo. P. Taylor, of Ahmadábád. It was Dr. Taylor who pointed out, for the first time, that *Ahmadábád*, like other epithets, was associated also with the *title* Zinat-ul-Bulad (the Beauty of Towns). *Vide* his interesting article on "Coins of Ahmadábád," pages 436-437, Plate V. Volume XX. No. LVI, Journal Bombay B.R.A. Society.

F. J. THĀNAWĀLĀ,
Bombay.

44. A NEW TYPE OF THE COINS OF SHĀH SHUJĀ'.

The coin described below has recently been acquired for the Lucknow Museum from a find in the Bāndā District.

Obverse.	*Reverse.*
لا اله الا الله	(? با) دو غازي
محـــــــمد	محمد شاه احد شجاع
رسول الله	سکندر ذصـــــــر الد

Margin doubtful.

Æ. *Weight*, 143. *Size*, ·75 inch.

No coins of Shāh Shujā are recorded in the catalogues of the Calcutta and Lâhore Museums. The British Museum Catalogue describes two coins (Nos. 690 and 691). The reading of the new coin differs from these in the case of the reverse. There is no trace of a square area, and in this respect the new coin resembles the early issues of Shāh Jahān. The horizontal mark below the first line is probably part of the word شاه, and the similar mark above the last line is possibly ين, the completion of the word الد which commences in the last line. I cannot explain the letter read as و which comes between باد and غازي in the first line. The reading of the last line suggests that the lower margin of the reverse on both the coins described in the B.M. catalogue should read سكندر شاه. In Coin No. 690 it is read (ا) كبر (ا) باد which is historically improbable. The right margin of Coin No. 691 is read جلون اباد. A comparison with Coin No. 690 shows that it should be صاحبقران ثاني. The top margin of No. 691 seems to read نصير الدين......, which presents a difficulty.

R. Burn.

45. ON THE IDENTITY OF THE COINS OF GUJARĀT FABRIC AND THE SŪRAT MAḤMŪDĪS.

In this article I purpose submitting evidence which, in my opinion, goes to prove that the silver coins designated in the British Museum Catalogue coins of "Gujarāt Fabric" are identical with those known to early writers under the name of "Sūrat Maḥmūdīs."

I. From the testimony of European travellers in India in the seventeenth century, it is clear that in the first half of that century silver coins of two distinct types were current in and around the city of Sūrat.

(*a*) Edward Terry, "Chaplain to the Right Hon. Sir Thomas Row, Knt.," landed from the good ship "Charles" at the port of Sūrat on the 25th of September, 1616 (A.H. 1025). In his "Voyage to East India," first published in 1655, he thus writes:—

> "They call their pieces of money roopes, of which
> "there are some of divers values, the meanest
> "worth two shillings and three-pence, and the
> "best two shillings and nine-pence sterling. By
> "these they account their estates and payments.
> "They have another coin of inferior value in
> "Guzarat, called Mamoodies, about twelve-pence
> "sterling; both the former and these are made in
> "halves, and and some few in quarters; so that
> "three-pence is the least piece of silver current in
> "those countries, and very few of them to be seen.

> "..........Their silver coin is made either round or "square, but so thick as that it never breaks, nor "wears out.[1]"

The "meanest" rupees in this passage correspond doubtless to the ordinary rupees issued by Akbar and Jahāngīr, weighing each about 180 grains; but the "best" rupees will be the heavy ones, from 212 to 220 grains each, that were struck in the first few years of Jahāngīr's reign. The ratio of the former to the latter would be 180: 220, or, as Terry has it, 27 : 33. But besides these rupees a coin distinctly inferior was also current in Gujarāt, to wit, the "mamoody," worth about 12*d.*, or a little less than half the ordinary rupee of that time.

(*b*) Sir Thomas Herbert, who, as Secretary to the English Embassy to Persia, journeyed in the East from 1627 to 1629 (A.H. 1037-9), writes in his "Travels" regarding the money of "Indostan."

> "The current money here is pice, which is an heavy "round piece of brass, 30 of which make one "shilling. The Mamoody, which is of good "silver, round and thick, stamped after the manner of the Saracens (who allow no images) with "Arabick letters, only importing the King and "Mahomet, is in value one shilling of our coin; "and the Roopee, which is made also of like pure "silver, is 2*s.* 3*d.*, and a Pardow 4*s.*[2]

(*c*) But it is Albert de Mandelslo, resident in Sūrat in 1638 (A.H. 1048), who gives the most precise information as to the money current in "the Kingdome of Guzuratta." In his "Voyages and Travels" he writes:—

> "They have also two sorts of money, to wit, the "Mamoudies and the Ropias. The Mamoudis are "made at Surat, of silver of a very base alley, and "are worth about twelve-pence sterling, and they "go onely at Surat, Brodra, Broitchia, Cambaya, "and those parts. Over all the Kingdome besides, as at Amadabath and elsewhere, they have "Ropias Chagam, which are very good silver, "and worth halfe a crown French mony. Their "small mony is of copper, and these are the "Peyses we spoke of, and whereof twenty-six "make a Mamoudy, and fifty-four a Ropia......... "Spanish Ryalls and Rixdollars are worth there "five Mamoudis......The Chequines and Ducats of "Venice are more common there (than the Xera- "phins), and are worth eight and a half, and

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[1] **Terry : "A Voyage to East India," edition of 1777, p. 113.**

[2] **Harris : "A Compleat Collection of Voyages and Travels," Vol. I., p. 411.**

> "sometimes nine Ropias, Surat-money, according to the change and the rate set on the "money."[1]

Reckoning the French crown (écu), the Spanish real, and the German rixdollar (reichsthaler) each at *4s. 6d.*, and the Italian sequin and Venetian (gold) ducat each at *9s. 4d.*, we arrive, according to the above passage, at the following values: The "Ropia Chagam" *27d.*; the Maḥmūdī, or "Ropia, Surat-money," *12d.*, or *13d.* or *10·8d.* or *12·4d.* It thus appears that, while the "Ropia Chagam," which is evidently the full Imperial rupee, stood fairly constant at *27d.*, the value of the Sūrat Maḥmūdī fluctuated between a minimum of *10·8d.* and a maximum of *13d.* We should also bear in mind that the silver of the Maḥmūdī is here stated to have been inferior to that of the rupee; also that the district in which the Maḥmūdī passed as current coin was limited to the southern part of the province of Gujarāt, say from Sūrat to Cambay.

II. With what coin may we identify this Sūrat Maḥmūdī? Is it the same as the well-known Maḥmūdī of Persia?

That any Persian money should have been current in Gujarāt and restricted there to merely the southern districts is certainly very improbable.

Moreover the value of this Persian Maḥmūdī is given by Tavernier as one-sixteenth of the Venetian sequin, *i.e.*, *7d.* or one-eighth of the Spanish dollar, *i.e.*, *6¾d.*[2] Also in the Table of Equivalences prefixed to J. P[hillips]'s English Translation of Tavernier's "Six Voyages" (1636-1667) the Persian Maḥmūdī is entered as *8·05d.* This, then, is plainly a considerably less valuable silver piece than the Sūrat Maḥmūdī ranging from *10·8d.* to *13d.*

When treating of the Persian coins, Fryer, whose eight letters were written from India or Persia between the years 1672 and 1681, states—

> "3 Shahees is 1 Mam. Surat;
> 2 Shahees is 1 Mamood. Persia."[3]

When Fryer thus definitely distinguishes between the Sūrat Maḥmūdī and the Persian, we may safely conclude that the two coins are not identical.

III. Can the Sūrat Maḥmūdī have been a silver coin of one or other of the various types that were current in Cutch and Kāṭhīāwār (Navānagar, Jūnagaḍh, and Porbandar)?

The trade between Gujarāt and Cutch, or Gujarāt and Kāṭhīāwār, was for the most part carried on by land and not by sea, and the influence of this trade would thus be specially felt in the north and north-west portion of the province. It hence appears extremely improbable that any coins from Cutch or Kāṭhiāwār should become the circulating medium in South Gujarāt, yet not find acceptance as currency for Aḥmadabād and the north.

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[1] Mandelslo: "Voyages and Travels": English translation by John Davies, edition of 1662, p. 85.

Ball's edition of "Travels in India by Jean Baptiste Tavernier," Vol I., p. 26, n. 4.

[3] Fryer: "A New Account of East India and Persia": edition of 1698, p 211.

The coins of Cutch and Kāṭhiāwar may indeed have been originally called 'maḥmūdis,' but this designation soon gave place to the term 'korī,' the name that still attaches to them. Accordingly, if ever current in the Sūrat district, they would, in all probability, have been denominated not the Maḥmūdīs but the Korīs of Sūrat.

Lastly, these Korīs, like the Persian Maḥmūdīs, were all of them considerably inferior in value to the Sūrat Maḥmūdī. The latter, we have seen, was reckoned at about **12***d.*, the rupee being 27*d.*, but the Cutch Korī is now, and was probably then too, appraised at 7·**1***d.*, that of Jūnagaḍh at 7·3*d.*, of Navānagar at 7·6*d.*, and of Porbandar at 8·5*d.* Or, to express these relative values in another way, in exchange for Rs. 100, 225 Sūrat Maḥmūdīs sufficed; but of the Rāṇāshāī Korīs of Porbandar 318 were required; of the Jāmshāī Korīs of Navānagar, 355; of the Dīwānshāī Korīs of Jūnagaḍh, 369; and of the Korīs of Cutch, 380. In fact it would seem that, while the Surāt Maḥmūdī fluctuated between half a rupee and a third, inclining to the half, the Korī ranged in value between a third of a rupee and a quarter, inclining to the quarter.

For the above reasons the conclusion is inevitable that the Korī, whether of Cutch or of Kāṭhiāwār, cannot be regarded as identical with the Surāt Maḥmūdī.

IV. Were the Sūrat Maḥmūdīs the same as the silver coins of the Gujarāt Salṭanat?

No reason can be given why the Gujarāt Salṭanat coins should have remained current in the south of Gujarāt, yet not in the north. Indeed, bearing in mind that during the declining years of the Salṭanat, say, after the death of Bahādur in 1536, its coins probably all issued from a single mint—that of Aḥmadābād—we may fairly assume that they would survive in circulation longer in the Aḥmadābād, or northern, districts than in the south. It seems incredible that coins struck in Aḥmadābād should be superseded there and yet be accepted as the currency of Sūrat.

It was in A.H. 980 (A.D. 1573) that Akbar conquered Gujarāt and annexed it to his Empire. In that same year he issued coins in his own name from the Aḥmadābād Mint, and we may safely affirm that thereafter he would permit no more coins to be struck in the name of the vanquished Sulṭān Muẓaffar III. Save for the five months of A.H. 991 (A.D. 1583) when Muẓaffar again held the sovereignty of Gujarāt, the minting of coins of the independent Salṭānat must have ceased in the year 1573, thus some sixty-five years before Mandelslo's visit to Sūrat. Now it is surely most improbable that during all these sixty-five years the coinage—never very plentiful—of the conquered province of Gujarāt should have maintained its standing as the recognised currency of the southern districts.

We have already seen that the Sūrat Maḥmūdī was worth just about four-ninths of the Imperial rupee, hence, had both coins been of equally good silver, the Maḥmūdī would have weighed 80 grains over against the 180 grains of the rupee. Its actual weight, however, owing to the presence of a "very base alley," must have been more than 80 grains, say between 85 and 90. Now, no silver coins of the Gujarāt Salṭanat are known of this weight: they are all either much lighter or much heavier. Of fifteen silver coins of Muẕaffar III, now in my possession, the weights are as follow:—

35, 36, 67, 70, 71, 72 (four), 73, 74, 110, 111, 112, and 114 grains. Of these not one could by any possibility be regarded as in value four-fifths of a Mughal rupee.

Thus we are compelled to the conclusion that the Sūrat Maḥmūdī was not identical with any silver coin of the Gujarāt Salṭanat.

V. If, now, this Maḥmūdī current in Sūrat was not the Persian Maḥmūdī, nor the Cutch or Kāṭhiāwār Korī, nor the Maḥmūdī of the Gujarāt Salṭanat, then, by the "method of exhaustion," it must have been the Coin of Gujarāt Fabric—the only remaning type. The identity of these two is confirmed by the following considerations:—

(*a*) All the Gujarāt Fabric coins bear impressed the name of Akbar, the conqueror of the province, and hence the Imperial Government would readily sanction the use of such coins for currency in a portion of the Empire.

(*b*) The dates on these coins, ranging, so far as yet known, from A.H. 989 to 1027 (A.D. 1581-1618), bring them easily within the period to which the statements made regarding the Sūrat Maḥmūdī by Terry and Herbert and Mandelslo have reference.

(*c*) One comes across these coins nowadays in the strip of country between Sūrat and Aḥmadābād, but they are seldom found in Kāṭhiāwār or in North Gujarāt. Thus it is the area in which the Sūrat Maḥmūdīs were originally current that mainly supplies us at the present day with specimens of Gujarāt Fabric coins.

(*d*) And—most important of all—the average weight of these Gujarāt Fabric coins which now come to hand proves to be 85 grains. Hence we may infer the original weight to have been about 90 grains. Considering both their base material and their weight, the money-value of such coins would bear to that of the Akbarī or ordinary Jahāngīrī rupee a ratio of just about 12 : 27—the ratio affirmed by Mandelslo to subsist between the Sūrat Maḥmūdī and the "Ropia Chagam."

If, then, as the conclusion of the whole matter, we may regard the Gujarāt Fabric coins as identical with the Sūrat Maḥmūdis, we may further unhesitatingly accept as true Mandelslo's express statement that these coins were "made at Sūrat." For a currency purely local there was a purely local mintage. The capital city of the province, Aḥmadābād, issued imperial rupees in the very year of the imperial conquest; but soon thereafter the less important city in the south, Sūrat, opened with, we may well believe, imperial sanction, a mint of its own, whence for some forty years issued not indeed "Ropias Chagam" but the Sūrat Maḥmūdī, known to-day as the coins of "Gujarāt Fabric."

Aḥmadabad. GEO. P. TAYLOR.

V.—MISCELLANEOUS.

46. ON SOME "GENEALOGICAL" COINS OF THE GUJARĀT SALṬANAT.

On the occasion of a recent visit to Bombay it was my good fortune to visit the rooms of the Bombay Branch of the Royal Asiatic Society in the company of my kind friend Mr. Framji Jamaspji Thanawala. He had previously written me that in the Society's cabinet he had discovered two coins of the Gujarāt Salṭanat, remarkable since bearing the pedigree of the regnant Sulṭān traced back, in each case, to the founder of the dynasty. Two such, if we may so call them, "genealogical" coins of Gujarāt have already been published, one in Thomas' "Paṭhān Kings," and the other in the Journal of the Bo. Br. R.A.S. No. LVIII. A description of all the four coins now known of this extremely rare type may prove of interest.

1. *Vide* Thomas: "Paṭhān Kings," page 352.

Æ.
Weight, 172 grains.
Date, A.H. 828 (by a misprint entered in Thomas as A.H. 823), A.D. 1424-25.

……

Obverse.

احمد شاه بن محمد
شاه بن مظفر شاه
خلد خلافته ۸۲۸

Reverse.

السلطان الاعظم
ناصر الدنيا و الدين
ابو الفتح

2. In cabinet of Bo. Br. R.A.S. This coin was once looped, but the loop has been wrenched off.

Æ.
Weight, 167 grains.
Date, wanting.

Obverse. In square.

احمد شاه بن محمد
شاه بن مظفر
شاه خلدت خلافته

Margins quite illegible.

Reverse.

السلطان الاعظم
ناصر الدنيا و الدين
ابو الفتح

3. In cabinet of Bo. Br. R.A.S. This coin is looped.

Æ.
Weight, 188 grains.
Date, A.H. [8]65, A.D. 1460-61.

Obverse.

محمود شاه ابن محمد
شاه ابن احمد شاه ابن محمد
شاه ابن مظفر شاه
... ... ٦٥

On the last line the first word is probably السلطان

Reverse.

الواثق بالله المنان
ناصر الدنيا و الدين
ابو الفتح

This is the earliest Gujarât coin yet known bearing the phrase الواثق بالله المنان, the Truster in Allah, the Gracious.

4. *Vide* Jour Bo. Br. R.A.S., No. LVIII., page 334, and Plate IV.

AR.
Weight, 130 grains.
Date, A.H. 933, (A. D. 1526-27).

Obverse.

قطب الدنیا و الدین ابوالفضل
بهادر شاه بن مظفر شاه

Part of this legend is worn, but it is probable that the coin bore at this part the words ابوالفضل

Reverse.

بن محمود شاه بن محمد شاه
بن احمدشاه بن محمدشاه بن مظفرشاه
٩٣٣

Thus the legend, beginning on the obverse, is continued on the reverse.

This most interesting coin was very kindly presented to me four years ago by Mr. H. Nelson Wright, I.C.S.

In connexion with these four "genealogical" coins in silver, reference may be made to a bullion coin of allied type, struck by

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N.B.—The following Genealogical Table includes all the kings of the Gujarāt Salṭanat whose names occur on any of the five coins :—

2.—Muẕaffar I., H. 810-813.
|
1.—Muḥammad I., H. 806.
|
3.—Aḥmad I., H. 813-846.
|
4.—Muḥammad II., H. 846-855.
|

5. Quṭbaldin Aḥmad II., H. 855-863.

6.—Maḥmūd I., H. 863-917.
|
7.—Muẕaffar II., H. 917-932.
|
8.—Bahādur, H. 932-943.

Maḥmūd I in A.H. 863 (A.D. 1458-59), in which his relationship to the two preceding Sulṭāns is indicated. The coin is figured on Plate II (Nos. 15*a*, 15*b*) of the Jour. Bo. Br. R.A.S., No. LVIII.

Its legends read as follow :—

Obverse.

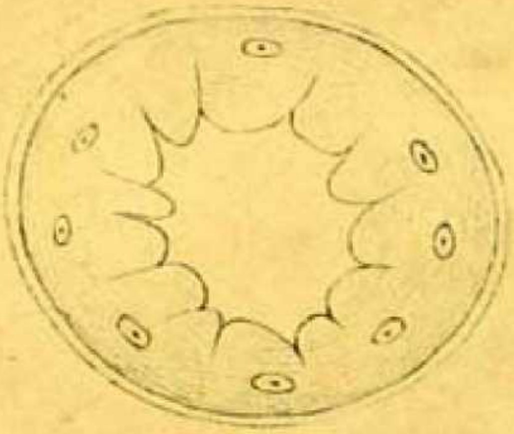
ناصر الدنیا و
الدین ابو الفتح
محمود شاه

Reverse.

اخ قطب شاه
بن محمد شاه
السلطان ٨٦٣

Aḥmadābād. GEO. P. TAYLOR.

Journ. & Proc. A.S.B., Vol. 1, 1905.



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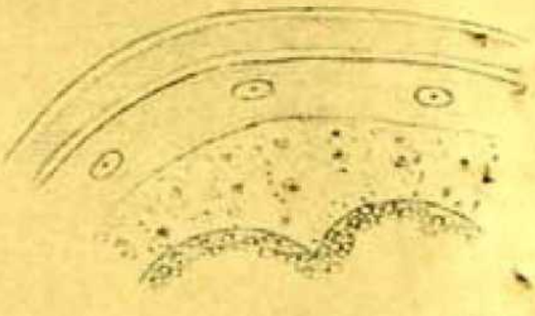

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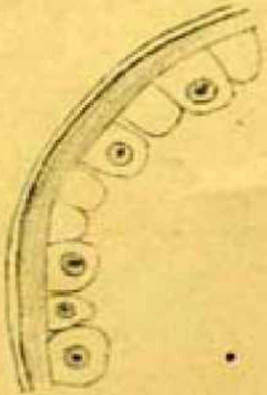

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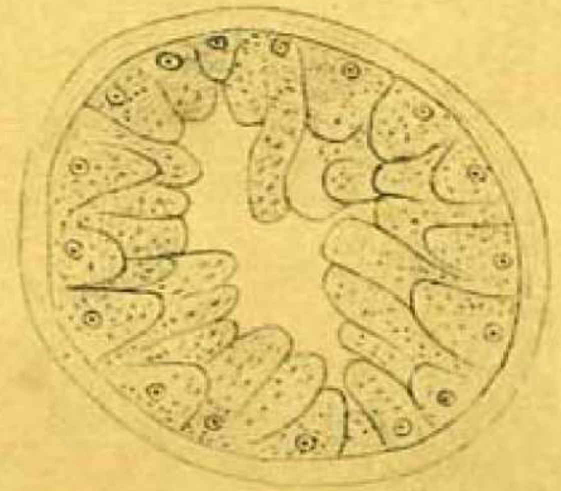

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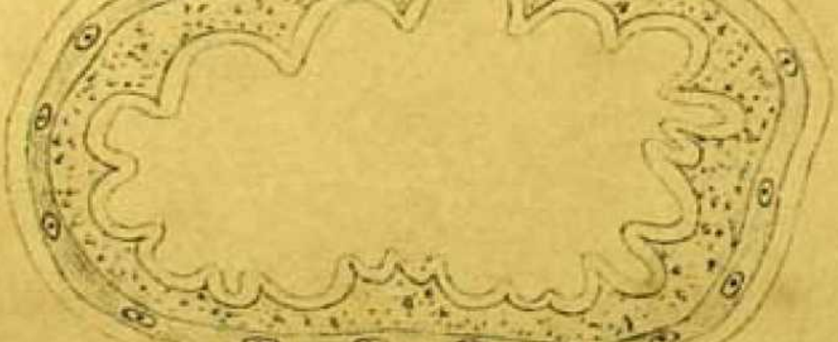

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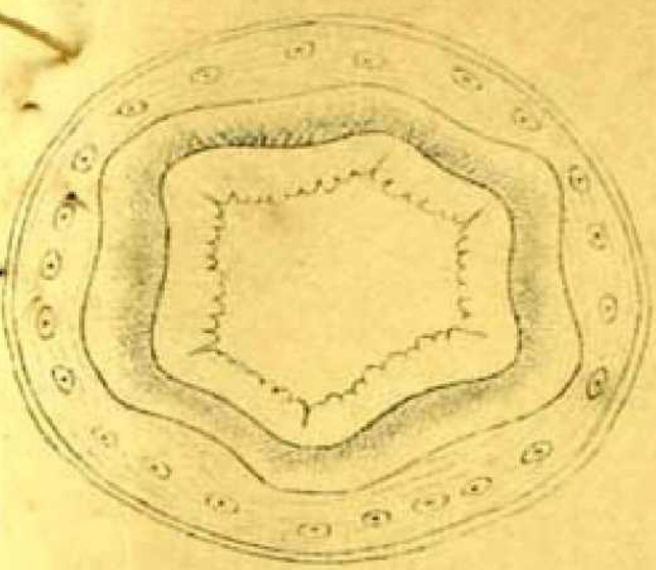

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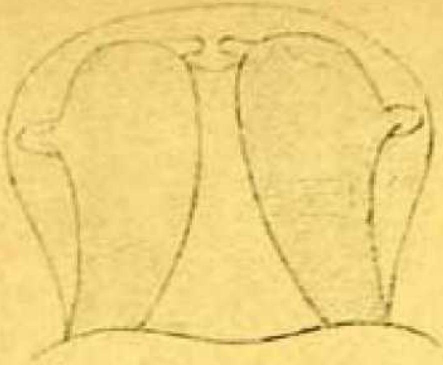

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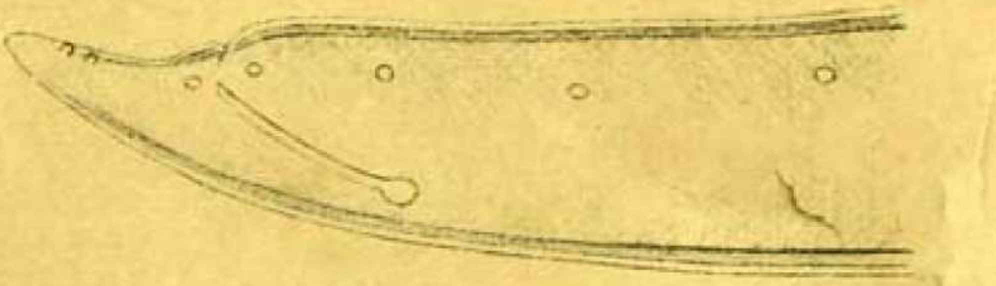

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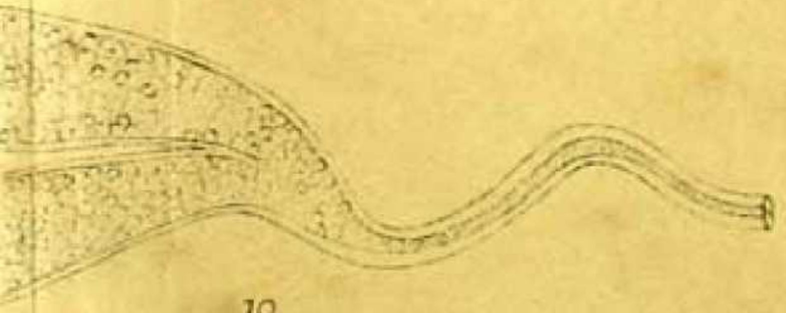

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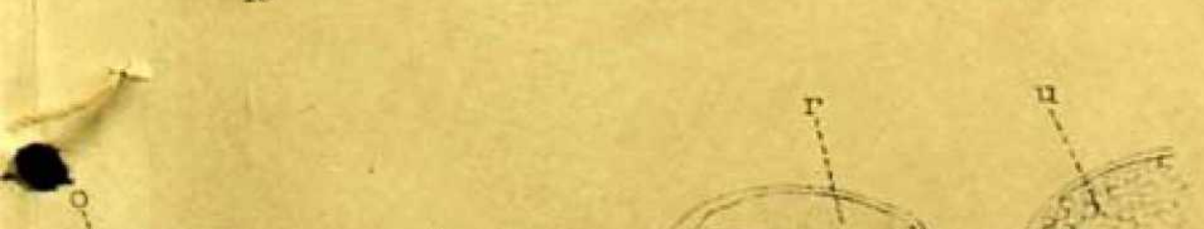

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S.C.Mondul lith.

RIS HALICORIS, Baird.

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

VOL. LXXIV., PART II.—Extra Number, 1905.

Materials for a Flora of the Malayan Peninsula.—By SIR GEORGE KING, K.C.I.E., LL.D., F.R.S., *late Superintendent of the Royal Botanic Garden, Calcutta, and* J. S. GAMBLE, C.I.E., F.R.S., *late of the Indian Forest Department.*

No. 16.

The present contribution commences with an account of the genus *Psychotria*, which concludes the Natural Order *Rubiaceæ*. In addition, it contains accounts of the Natural Orders *Valerianeæ* and *Compositæ* (prepared by Sir G. King); *Stylidieæ*, *Goodenovieæ*, and *Campanulaceæ* (prepared by Mr. Gamble); *Vacciniaceæ* and *Ericaceæ* (Sir G. King); *Epacrideæ* and *Plumbagineæ* (Mr. Gamble). For the new genera and species proposed in these Orders the authors are jointly responsible. The account of the Order *Monotropeæ* has been supplied by Lieut.-Col. Prain, F.R.S., Superintendent of the Royal Botanic Garden, Calcutta; and that of the Order *Gentianeæ* has been added, having been drawn up by Mr. C. B. Clarke, F.R.S., late President of the Linnean Society of London. It is somewhat out of its proper sequence, but has been included, as the descriptions were ready for publication.

In addition, therefore, to the account of the Rubiaceous genus *Psychotria*, with 29 Malayan Peninsular species, of which 11 are new to science, this fasciculus contains accounts of the Malayan members of 11 Natural Orders, including 48 genera and 81 species, of which 2 genera and 17 species are new to science.

Nat. Ord. LIX. RUBIACEÆ.

53. PSYCHOTRIA, Linn.

Shrubs or small trees, erect or occasionally climbing or twining; rarely herbs. *Leaves* opposite, rarely in whorls of 3 or 4. *Stipules* free in pairs, or connate, often with glands or hairs, deciduous or persistent. *Flowers* rather small, in terminal, rarely axillary, cymes corymbs or fascicles, bracteolate or not, never involucrate (in the Malayan species). *Calyx-tube* short; the limb persistent in part or deciduous. *Corolla-tube* straight, short; the throat naked or hairy; the lobes of the mouth 5, rarely 4 to 6, valvate in bud. *Stamens* as many as the corolla-lobes, inserted on the throat or mouth; anthers linear or obtuse, attached dorsally near the base to short or long filaments. *Ovary* 2-celled; style long or short, bifid; ovules often cuneiform, solitary, erect from the base of each cell. *Fruit* small, baccate or drupe-like, ovoid globose or oblong, smooth or ridged, composed of two plano-convex, 1-celled, 1-seeded pyrenes; or didymous and separating into two cocci. *Seeds* plano-convex, the ventral surface grooved or plane, the dorsal smooth, ridged or sulcate; testa thin, albumen hard; embryo small, basal; cotyledons broad, thin; radicle inferior.—DISTRIB. Species about 550; tropical or sub-tropical.

Scandent:—
Flowers 4-merous:—
Panicles lax; leaves elliptic- or oblong-lanceolate .. 1. *P. laxiflora.*
Flowers 5-merous:—
Seeds with 4 ridges on the dorsal surface, the ventral surface plane:—
Flowers sessile in small capitula at the ends of the branches of the cymes:—
Leaves ovate to oblong-elliptic, 1·75 to 2·5 in. broad; inflorescence puberulous .. .. .. 2. *P. morindæflora.*
Leaves narrowly elliptic, less than 1·25 in. broad; inflorescence coarsely pubescent .. .. 3. *P. Maingayi.*
Flowers pedicellate in cymosely branched cymes:—
Leaves elliptic-oblanceolate to elliptic, the midrib sometimes pubescent on the lower surface, otherwise glabrous; main-nerves 7 to 10 pairs; petioles ·4 to ·75 in. long; fruit ·25 in. long .. .. 4. *P. sarmentosa.*
Leaves narrowly elliptic-oblong, main-nerves 4 to 6 pairs; petioles ·4 to ·8 in. long; fruit ·35 in. long .. 5. *P. Kunstleri.*
Leaves broadly obovate or sub-ovate; main-nerves 5 to 10 pairs; petioles ·5 to 1·5 in.; fruit ·4 in. long.. 6. *P. penangensis.*
Seeds with 3 ridges on the dorsal surface, the ventral surface plane:—
Flowers pedicellate, in cymosely branched paniculate cymes; fruit narrowly ellipsoid .. .. 7. *P Scortechinii.*
Flowers on short pedicels in globular cymes at the ends of the branches of the panicles:—
Leaves and stems glabrous; fruit subglobose, ·2 in. long .. .. 8. *P. pilulifera.*
Leaves and stems and inflorescence rusty-pubescent 9. *P. ovoidea.*
Seeds with more than 4 ridges on both dorsal and ventral surfaces .. .. 10. *P. Ridleyi.*

Seeds faintly ridged on the dorsal surface, the ventral surface with a shallow groove .. .. .. 11. *P. polycarpa.*

Erect shrubs, usually small:—

Flowers 4-merous:—

Leaves with a strong pale intra-marginal nerve .. 12. *P. calocarpa.*

Flowers 5-merous:—

Flowers shortly pedicellate, in dense globular cymules at the ends of the long-peduncled branches of a terminal umbellate cyme; leaves deciduously puberulous, with 9 to 13 pairs of main-nerves; fruit ·3 in. long; seeds 4-ridged on the dorsal surface, slightly concave on the ventral .. .. 13. *P. multicapitulata.*

Flowers sub-sessile, in short condensed dichotomous sessile axillary cymes; leaves with scurfy pubescence and 8 to 11 pairs of main-nerves; seeds 5-ridged on the dorsal and broadly grooved on the ventral surface .. .. 14. *P. tortilis.*

Flowers in a terminal umbellately branching cyme:—

Seeds with a single dorsal ridge, the ventral surface plane:—

Leaves quite glabrous:—

Leaves 6 to 10 in. long; main-nerves 12 to 15 pairs .. .. 15. *P. Griffithii.*

Leaves usually under 6 in. long, main-nerves 8 to 10 pairs .. .. 16. *P. angulata.*

Leaves adpressed-pubescent, 6 to 12 in. long .. 17. *P. Helferiana.*

Seeds with a single dorsal ridge, the ventral surface with a groove; leaves 5 to 8 in. long, quite glabrous, main-nerves 7 to 8, rarely 10 pairs .. .. 18. *P. montana.*

Seeds with 5 ridges on the dorsal surface, the ventral surface plane:—

Leaves glabrous:—

Leaves oblong-elliptic to oblanceolate-elliptic, 3·5 to 8 in. long; fruit ·25 in. long .. .. 19. *P. viridiflora.*

Leaves softly pubescent:—

Leaves elliptic to elliptic-oblong, the bases cuneate rounded or cordate, 3·5 to 5 in. long; fruit ·25 to ·3 in. long .. .. 20. *P. Birchiana.*

Leaves elliptic, the upper surface glabrous except the midrib, 5 to 7 in. long; fruit ·45 in. long .. 21. *P. fulva.*

Seeds 5-ridged on the dorsal surface and 2-grooved on the ventral; leaves glabrous on the upper surface, their margins crenulate .. .. .. 22. *P. fulvoidea.*

Seeds with 5 ridges on the dorsal surface and 1 ridge on the ventral; leaves glabrous, usually oblanceolate 23. *P. stipulacea.*

Seeds 4-ridged on the dorsal surface, plane on the ventral:—

Leaves elliptic, tapering equally to each end, 9- to 10-nerved; calyx-lobes very long caudate-acuminate 24. *P. Curtisii.*

Leaves obovate-oblong or obovate-oblanceolate, 10- to 14-nerved; calyx-lobes short, broad, blunt .. 25. *P. rhinocerotis.*

Seeds with 4 ridges on the dorsal surface and a faint groove on the ventral; leaves elliptic or elliptic-lanceolate, 12- to 18-nerved .. .. .. 26. *P. malayana.*

SPECIES IMPERFECTLY KNOWN.

Psychotria Wrayi, No. 27.
,, *inæqualis*, No. 28.
,, *condensa*, No. 29.

1. PSYCHOTRIA LAXIFLORA, Blume Bijdr. 964. Scandent or epiphytic, glabrous except the inflorescence; young branches slightly thicker than a crow-quill, terete, dark-coloured, brown, shining. *Leaves* membranous, narrowly elliptic- or oblong-lanceolate, much acuminate, the base cuneate; both surfaces olivaceous-brown when dry, the lower the paler, midrib distinct; main-nerves 4 to 6 pairs, faint, curved, ascending; length 2 to 4 in.; breadth ·5 to 1 in.; petiole ·15 to ·2 in. long. *Stipules* forming a tube from ·15 to ·3 in. long, sharply toothed. *Panicles* solitary, terminal, lax, more than half as long as the leaves, on naked peduncles about 1 in. long; branches cymose, with small acute bracteoles at their bases, puberulous. *Flowers* ·15 to ·2 in. long, puberulous, in cymules of three at the ends of the branchlets; their pedicels short, with broad acute caducous bracteoles at their bases. *Calyx* shortly funnel-shaped, the mouth sub-truncate or obscurely 4 toothed. *Corolla* longer than the calyx, broadly clavate in bud, funnel-shaped; the mouth with 4 broad obtuse lobes, throat sericeous. *Anthers* 4, elliptic, blunt, sub-sessile. *Fruit* clavate-ellipsoid, with 8 vertical ridges (2 of them double), glabrous; seeds with 4 bold ridges on the dorsal surface; the ventral surface quite flat. Miq. Fl. Ind. Bat. II. 187.

SINGAPORE: *Ridley* 13, 4828. JOHORE: *Ridley*. PERAK: *King's Collector* 4117, 8428; *Wray* 110.—DISTRIB. Sumatra, *Forbes* 1297, 1309, 1710, 2466; Java, *Koorders* 23550B.

2. PSYCHOTRIA MORINDÆFLORA, Wall. Cat. 8438 A.B.C. in part. A woody climber, 15 to 20 feet long, glabrous except the puberulous inflorescence; young branches thinner than a goose-quill, dark brown when dry, terete, somewhat thickened at the nodes, the internodes minutely lenticellate and faintly striate. *Leaves* coriaceous, ovate to elliptic, sometimes oblong-lanceolate, shortly and rather bluntly acuminate, the base slightly cuneate or rarely rounded; upper surface olivaceous-greenish when dry, the lower purplish-brown; the midrib channelled on the upper surface, prominent on the lower; main-nerves 6 to 8 pairs, rather straight, spreading, thin but rather distinct on both surfaces when dry; length 3 to 4·5 in.; breadth 1·75 to 2·5 in.; petiole

·2 to ·5 in. *Stipules* caducous, leaving a pale narrow scar between the petioles. *Cymes* terminal, about 2 in., rarely 3 in. long; the branches compressed and angled, scurfy-puberulous, two of them springing from the base, the other three umbellate at the apex of the main axis, each bearing at its apex a dense, many-flowered, minutely bracteolate capitulum less than ·5 in. in diam. *Flowers* ·2 in. long, sessile. *Calyx* cupular, the mouth with 5 small blunt teeth. *Corolla* twice as long as the calyx; the mouth with 5 deep oblong blunt lobes; throat densely sericeous. *Anthers* 5, short, elliptic, basifixed on stout filaments. *Style* cylindric, thickened upwards; stigma of 2 broad lobes. *Fruit* short, compressed ovoid-elliptic, with 8 vertical ridges (2 of them double) crowned by the small calyx, ·25 in. long and ·15 in. in diam. from front to back; seeds with 4 dorsal ridges; ventral surface plane. Hook. fil. Fl. Br. Ind. III. 166. *Psychotria?* Wall. Cat. 8355.

PERAK: *King's Collector* 2585, 2665; *Scortechini* 1826; *Wray* 4001. PENANG: *Wallich; Curtis* 478.

3. PSYCHOTRIA MAINGAYI, Hook. fil. Fl. Br. Ind. III. 166. A slender woody climber; young branches half as thick as a goose-quill, pubescent, ultimately pale and glabrous. *Leaves* thickly membranous, narrowly elliptic, caudate-acuminate, the base much narrowed; both surfaces glabrous, when dry pale olivaceous, the upper rather the darker; main-nerves about 6 pairs, indistinct on both surfaces like the midrib; length 2 to 3·25 in.; breadth ·65 to 1·2 in.; petiole ·1 to ·2 in., slender. *Stipules* cartilaginous, persistent, connate into a tube ·15 in. long with a few hairs at the truncate and toothed or acute apex. *Cymes* axillary, on slender, compressed, coarsely pubescent peduncles shorter than the leaves, few-branched. *Flowers* sessile, bracteoles linear. *Calyx* much longer than the pubescent ovary, widely campanulate; the lobes ovate-triangular, caudate-acuminate, spreading. *Corolla* unknown. *Fruit* broadly ellipsoid, with 8 deep vertical grooves, pale, nearly glabrous when ripe, ·2 in. long.

SINGAPORE: *Maingay* (K.D.) 926; *Ridley* 6924.

4. PSYCHOTRIA SARMENTOSA, Blume Bijdr. 964. Scandent; woody; young stems thinner than a goose-quill, pale, glabrous. *Leaves* thinly coriaceous, elliptic-oblanceolate to elliptic, acute or shortly and abruptly acuminate, much narrowed at the base, edges slightly recurved; both surfaces pale brown tinged with olivaceous when dry, minutely reticulate; the upper glabrous, the lower sometimes pubescent only on the stout midrib; main-nerves 7 to 10 pairs, curving slightly upwards, faint; length 2·5 to 4 in.; breadth 1 to 1·75 in.; petioles ·4 to ·75 in., winged above. *Stipules* broad at the base, the apex caudate-acuminate.

Cymes terminal, puberulous, shorter than the leaves, on short peduncles, cymosely branched; the branches angled, spreading, many-flowered; bracteoles minute, linear. *Flowers* about ·15 in. long, puberulous outside, on short pedicels. *Calyx* campanulate, with 5 short triangular teeth. *Corolla* villous at the base in the interior. *Fruit* ellipsoid, ·25 in. long, with 10 vertical ridges (2 of them double). *Seeds* with 4 dorsal ridges, the ventral surface plane. DC. Prod. IV. 522; Wight Ic. 1038; Thwaites Enum. Pl. Ceyl. 148; Kurz For. Fl. Burm. II. 14; Hook. fil. Fl. Br. Ind. III. 165. *P. obovata*, Wall. Cat. 8380. *Grumilea Junghuhniana*, Miq. Fl. Ind. Bat. II. 296. *Psychotria* sp., Wall. Cat. 8382, 8352 ?, 8384.

SINGAPORE: *Ridley* 2874, 2875, 9112. MALACCA: *Griffith* (K.D.) 3043. PERAK: *King's Collector* 4967, 7572. PENANG: *King* 1346; *Curtis* 951, 2781.—DISTRIB. Burma, *Wallich*; *Helfer* (K.D.) 3041, &c.; Indian Peninsula; Ceylon; Malay Archipelago; Andaman Islands.

VAR. *pachyphylla*, King & Gamble. *Leaves* thickly coriaceous, shining, greenish when dry, 3 to 4 in. long; fruit ·25 in. long, subglobular.

PENANG: *Ridley* 9363; *Curtis* 2215.

5. PSYCHOTRIA KUNSTLERI, n. sp., King & Gamble. A glabrous epiphyte with slightly angled stems thinner than a goose-quill, pale yellowish when dry. *Leaves* succulent, glossy and bluish-green when fresh, but yellow on both surfaces and dull when dry, narrowly elliptic-oblong, rarely oblong-oblanceolate, gradually and equally tapering to each end; the midrib bold, channelled on the upper surface; main-nerves 4 to 6 pairs, spreading, very indistinct; length 3 to 5·5 in.; breadth ·8 to 1·4 in.; petioles ·4 to ·8 in. long. *Stipules* forming a cartilaginous persistent cup with an entire mouth, about ·1 in. long. *Cyme* solitary, umbellate, terminal, longer than the leaves (the naked peduncle of 2 to 3 in. being included), lax, from 2 to 4 in. broad; branches spreading, dividing near their apices into umbellate cymes; bracteoles few, linear, acute. *Flowers* not seen: on basally bracteolate pedicels as long as themselves. *Fruit* ·35 in. long, ellipsoid, deeply 10-grooved, crowned by the rather large remains of the 5-toothed calyx, 10-ridged. *Seeds* dorsally 4-ridged, the ventral surface flat.

PERAK: *Scortechini*; *King's Collector* 1886, 4953, 6588; *Wray* 2230.—DISTRIB. Sumatra, *Forbes* 2823.

6. PSYCHOTRIA PENANGENSIS, Hook. fil. Fl. Br. Ind. III. 175. A shrubby epiphyte or climber, 8 to 12 feet long, all parts except the inflorescence glabrous; young branches slightly compressed, thinner than a goose-quill, dark-coloured. *Leaves* thinly coriaceous, broadly elliptic-obovate or sub-ovate, shortly and abruptly triangular, acumi-

nate, much narrowed at the base into the broad petiole; both surfaces brown when dry, the upper slightly olivaceous; the midrib broad, channelled on the upper surface, main-nerves 5 to 10 pairs, spreading, thin, distinct on the lower surface; length 3 to 4·5 in.; breadth 1·5 to 2·5 in.; petiole ·5 to 1·5 in. long, slightly winged above. *Stipules* broadly ovate, sub-acute or blunt, sub-tubular, sometimes bifid, ·2 to ·4 in. long. *Cymes* umbellate, solitary or terminal, pedunculate, as long as or longer than the leaves (including the compressed naked 1 to 2 in. long peduncle); primary branches long, spreading; the ultimate umbels with broad-based subulate unequal bracteoles. *Flowers* ·2 to ·25 in. long, sessile or on short pedicels; bracts ·25 in. long. *Calyx-tube* obconic, its teeth triangular. *Corolla* longer than the calyx, shortly and widely tubular, deeply divided into 5 broad lobes thickened near the apex, the apex itself sharp and inflexed, glabrous inside except for the ring of hair in the throat at the insertion of the short filaments. *Anthers* elliptic, blunt, entire. *Fruit* ellipsoid, compressed, with 10 obtuse vertical ridges (2 of them double), glabrescent, crowned by the rather large calyx; length ·4 in.; breadth ·25 in. *Seeds* 2, plano-convex, the dorsal surface with 4 blunt ridges, the ventral surface plane.

MALACCA: *Maingay* (K.D.) 920. SINGAPORE: *Ridley* 2870. PERAK: *Scortechini* 2034; *King's Collector* 3049, 4591, 10723. SELANGOR: *Ridley* 7425. PANGKORE: *Curtis* 1621.

7. PSYCHOTRIA SCORTECHINII, n. sp., King & Gamble. A climber, all parts glabrous; young branches pale brown, thicker than a crow-quill, terete, smooth. *Leaves* membranous, ovate-lanceolate or narrowly elliptic, acuminate, the base narrowed or rarely rounded; both surfaces brown when dry (the lower slightly paler), the midrib prominent; main-nerves 5 or 6 pairs, curved, spreading, not prominent; length 2·5 to 4 in.; breadth 1 to 1·5 in.; petiole ·15 to ·2 in. *Stipules* oblong, acute, connate at their bases, ·15 to ·2 in. long, caducous. *Cymes* paniculate, solitary, terminal, rarely axillary, spreading, lax, cymosely branched, in flower as long as or nearly as long as the leaves, in fruit longer, the branches bracteolate, angled, divaricating. *Flowers* on the ultimate branchlets in threes, ·15 in. long, on short pedicels, each with a bracteole at the base. *Calyx* cupular, with 5 short acute teeth. *Corolla* longer than the calyx, cylindric, with short triangular lobes, the throat with tufts of yellowish hairs between the 5 stamens. *Anthers* on short filaments. *Style* cylindric, stigma 2-lobed. *Fruit* narrowly ellipsoid, tapering to each end, sometimes clavate, slightly compressed, 8-ridged (2 being double), crowned by the calyx, ·35 in. long and ·2 in. in diam. *Seeds* with 3 broad dorsal ridges, ventral surface plane.

PERAK: *Scortechini* 311, 404, 426; *King's Collector* 897, 2566, 5373.

This closely resembles *P. laxiflora*, Bl., but has 5-merous flowers and longer, less clavate fruit.

8. PSYCHOTRIA PILULIFERA, n. sp., King & Gamble. A small tree or climber; all parts except the inflorescence glabrous; young branches about as thick as a crow-quill, terete, pale brown when dry. *Leaves* coriaceous, narrowly elliptic, much tapered to both ends; both surfaces olivaceous when dry, the lower slightly the paler; main-nerves 6 or 7 pairs, inconspicuous, the midrib bold beneath when dry; length 2·5 to 3·5 in.; breadth ·75 to 1 in.; petiole ·35 to ·4 in. long, slender. *Inflorescence* a terminal, few-branched, puberulous panicle of condensed 8–10-flowered globular cymes. *Flowers* and their short pedicels minutely tomentose. *Calyx* shortly campanulate, the mouth with 5 spreading triangular acute lobes. *Corolla* tubular; the lobes oblong, broad, with small inflexed apices. *Anthers* 5, attached to the throat by short filaments surrounded by coarse hair. *Fruit* sub-globose, with 10 bold vertical ridges (2 of them double), crowned by the small calyx, ·2 long and ·15 in. in diam. *Seeds* with 3 bold ridges on the dorsal surface; ventral surface plane.

PERAK, at elevations of 3,000 to 5,000 feet: *Wray* 287, 398, 434, 946, 3870.

9. PSYCHOTRIA OVOIDEA, Wall. Cat. 8383. A slender woody climber, 20 to 40 feet long; stems thinner than a goose-quill, densely rusty-pubescent. *Leaves* with recurved margins, coriaceous, ovate- or elliptic-lanceolate, shortly acuminate, the base cuneate or rounded, sometimes minutely cordate; upper surface olivaceous when dry, glabrous, the main-nerves depressed; the lower brown, pubescent on the stout midrib and 5 to 7 pairs of prominent curved ascending main-nerves, puberulous on the interspaces; length 1·5 to 2·5 in.; breadth ·85 to 1·25 in.; petioles ·15 to ·25 in. long. *Stipules* connate, ovate-lanceolate, ·25 in. long, caducous. *Cymes* ·75 to 2 in. in diam., trichotomous, solitary, terminal, rusty-pubescent, on angled peduncles ·5 to 1 in. long. *Flowers* about ·15 in. long, on short pedicels, crowded in dense cymes at the ends of the branches and mixed with linear bracteoles. *Calyx* campanulate, with 5 spreading acute teeth. *Corolla* twice as long as the calyx, salver-shaped, with 5 lobes, the tube villous inside. *Fruit* ovoid-globose, ·15 in. long, the apex crowned by the calyx, the sides with 6 faint vertical ridges. *Seeds* faintly 3-ridged on the dorsal surface; the ventral surface broad, flat. Hook. fil. Fl. Br. Ind. III. 166.

SINGAPORE: *Wallich*, *Seeman* 2348. MALACCA: *Maingay* (K.D.) 923; *Ridley* 97, 8407.

10. PSYCHOTRIA RIDLEYI, n. sp., King & Gamble. A small shrub; all parts glabrous except the inflorescence; stems half as thick as a goose-quill, terete, greenish when dry. *Leaves* membranous, oblong- to elliptic-oblanceolate, the apex abruptly and very shortly acuminate, the base much narrowed, both surfaces pale olivaceous when dry, the midrib rather prominent, the upper sometimes with scattered minute, adpressed white hairs; main-nerves 7 to 9 pairs, slightly curved, spreading, faint on both surfaces; length 3 to 5·5 in.; breadth 1·25 to 2·25 in.; petioles ·4 to ·8 in. long, winged near the apex. *Stipules* broadly ovate, subacute, ·1 in. long. *Cyme* on a peduncle about 1 in. long (longer in fruit), corymbosely branched, the bracts at the forks linear-lanceolate. *Flowers* in cymules of three, everywhere canescent, on short pedicels bibracteolate at the base. *Calyx* campanulate with elongated tube; the mouth with 5 erect ovate-triangular lobes. *Corolla* longer than the calyx; the tube short, slightly villous at the base near the insertion of the broad sub-sessile anthers; the 5 lobes broadly ovate, acute. *Fruit* ovoid-ellipsoid, 12-ridged, crowned by the small calyx, ·3 to ·4 in. long. *Seeds* many-ridged on both dorsal and ventral surfaces.

SINGAPORE: *Ridley* 48, 10818. JOHORE: *Ridley* 6472. MALACCA: on Mt. Ophir, *Hullett* 811; *Goodenough* 1363.

11. PSYCHOTRIA POLYCARPA, Hook. fil. Fl. Br. Ind. III. 165. A climber, glabrous except the inflorescence; young branches thinner than a goose-quill, terete, when dry dark-coloured. *Leaves* coriaceous, ovate- or obovate-lanceolate to obovate- or ovate-rotund, the apex in the narrower forms shortly and bluntly acuminate, in the broader abruptly and bluntly apiculate; both surfaces olivaceous when dry, the upper somewhat shining, the lower dull and darker, the midrib prominent on both; main-nerves 5 or 6 pairs, spreading, faint on both surfaces; length 2 to 3 in.; breadth ·75 to 1·75 in.; petioles ·3 to ·6 in. *Stipules* very short, connate to form a collar, caducous. *Panicles* large, umbellately cymose, longer than the leaves (sometimes very much so); their branches numerous, spreading, puberulous, with minute bracteoles at the divisions. *Flowers* ·15 in. long, numerous, in ultimate cymules of 2 or 3, shortly pedicellate. *Calyx* thick, minutely pubescent, shortly campanulate or sub-cupular, the mouth with 5 acute teeth or subentire. *Corolla* longer than the calyx, salver-shaped, its 5 lobes spreading, lanceolate, acute, the throat sericeous; anthers 5, elliptic. *Fruit* ellipsoid, tapered to the base, and the apex crowned by the rather large remains of the calyx; obscurely ridged; ·15 in. long and ·1 in. in diam.; sometimes sub-globular, the epicarp somewhat pulpy. *Seeds* slightly convex and faintly ridged on the dorsal surface, the ventral with a broad

shallow groove. *P. obovata*, Wall. Cat. 8380A. *Grumilea polycarpa*, Miq. Fl. Ind. Bat. II. 295.

SINGAPORE: *Ridley* 2029. MALACCA: *Griffith* (K.D.) 3042; *Maingay* (K.D.) 924; *Hullett* 402. JOHORE: *Ridley* 4090, 11160. PENANG: *Curtis* 1095. PERAK: *Wray* and *King's Collector* many numbers. DISTRIB.—Java, *King*; *Forbes* 1061; *Koorders* 28043B.

12. PSYCHOTRIA CALOCARPA, Kurz in Journ. As. Soc. Beng., 1872, II. 315. A glabrous shrub 2 to 4 feet high; young branches thinner than a goose-quill, dark-coloured when dry. *Leaves* thickly membranous, oblong-oblanceolate or oblanceolate, shortly caudate-acuminate at the apex, much attenuate at the base, the edges sometimes broadly crenate; both surfaces olivaceous when dry, the midrib and nerves broad, distinct and pale; main-nerves 10 to 12 pairs, slightly curved, spreading and interarching to form a bold pale intramarginal nerve ·1 to ·15 in. from the edge; length 5 to 8 in.; breadth 1·65 to 2·5 in.; petiole ·75 to 1·25 in., slightly winged near the apex. *Stipules* broadly triangular, acuminate, membranous, sometimes bifid, ·2 in. long. *Cymes* terminal or axillary, sessile or shortly pedunculate, shorter than the petioles, about 1·25 in. across and ·5 in. long, branched from near the base, the branches compressed, trichotomous; the bracteoles lanceolate, acuminate. *Flowers* ·2 in. long, on short pedicels. *Calyx* with a short cylindric tube and 4 longer oblong blunt sub-erect concave lobes. *Corolla* exceeding the calyx, narrowly campanulate, bluntly 4-lobed, the throat densely sericeous, otherwise glabrous. *Fruit* sub-globose or ovoid, sub-compressed; the epicarp fleshy, glabrous, rugulose when dry; ·3 in. in breadth and rather less in length, the persistent calyx-lobes small. *Seeds* large, the dorsal surface faintly 1-ridged, the ventral deeply grooved. Kurz For. Fl. Burm. II. 9; Hook. fil. Fl. Br. Ind. III. 173. *P. asiatica*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 160; Wall. Cat. 8331: not of Linn. nor of Roxb. *P. viridiflora*, Reinw. var. *undulata*, Kurz For. Fl. Burm. II. 13. *P. picta*, Wall. Cat. 8353; and *Psychotria*, l.c. 8359.

PERAK: *Ridley* 7199; *Wray* 2200; *King's Collector* 1930, 2348, 6798, 10772; *Scortechini*. MALACCA: *Hervey*.—DISTRIB. Himalaya, Assam, Burma.

This plant is very common in the lower Himalaya, Assam, and Burma. In the Flora of British India it is described as herbaceous, but the Malayan specimens are all woody. The leaves are always readily distinguished, when dry, by the pale broad main-nerves and by the very conspicuous intra-marginal nerve. In Malaya the plant is glabrous, but in the Indian specimens the under surfaces of the leaves are deciduously puberulous.

13. PSYCHOTRIA MULTICAPITATA, n. sp. King & Gamble. An erect

much-branched shrub 3 to 7 feet high; young branches thinner than a goose-quill, slightly compressed, swollen at the nodes, pale, deciduously puberulous. *Leaves* thinly membranous, greenish when dry, broadly obovate-lanceolate, oblong or elliptic, abruptly and shortly caudate-acuminate, the base narrowed to the rather short petiole; upper surface quite glabrous; the lower scurfy-puberulous on the broad midrib and 9 to 13 pairs of curved spreading main-nerves; length 5 to 10 in.; breadth 2·5 to 4 in.; petiole ·75 to 1·15 in. *Stipules* free, broadly triangular, ·15 in. long. *Cymes* terminal, solitary, peduncled, about 2 in. long (including the peduncle) and the same in breadth, umbellately branched from near the base; the ultimate branches numerous, bearing terminal many-flowered globular minutely bracteolate cymules, about ·5 in. in diam., the common peduncle about an inch or more long, the branches shorter, all puberulous. *Flowers* on short puberulous pedicels, ovoid in bud; about ·15 in. long when expanded. *Calyx* cupular, with 5 or 6 triangular acute sub-erect teeth. *Corolla* longer than the calyx, the tube cylindric and, like the throat, densely white-sericeous inside; lobes of the limb short, triangular, deflexed. *Anthers* bifid at the base. *Style* thick, bifid, longer than the corolla. *Fruit* ellipsoid-obovoid, 10-ridged, crowned by the small calyx, glabrous, ·3 in. long. *Seed* dorsally with 4 faint ridges, ventrally somewhat concave.

PERAK: *Scortechini* 214, 291; *King's Collector* 436, 867, 2862, 5402, 7380, 7513, 10559.

14. PSCHYOTRIA TORTILIS, Blume Bijdr. 958. Stem woody below, erect, 6 to 18 in. high, not branched, cinereous, 4-angled, sparsely covered with short coarse scurfy hairs. *Leaves* membranous, broadly elliptic or ovate-elliptic, the apex acute or sub-acute, narrowed from below the middle to the petiole; upper surface when dry dark green, the lower pale, glaucous, minutely lepidote; the 8 to 11 pairs of slightly curved spreading main-nerves covered with minute short coarse deciduous dark-coloured hairs; length 4 to 6 in.; breadth 1·75 to 3 in.; petioles ·5 to 2 in., compressed, scurfy-pubescent. *Stipules* broadly triangular, much acuminate, bifid, ·15 to ·3 in. long. *Cymes* solitary, sessile, axillary, dichotomous, many-flowered, condensed, ·5 in. to 1 in. long and as much broad. *Flowers* ·15 in. long, on short ebracteolate pedicels. *Calyx* campanulate, with 5 triangular spreading teeth, covered with coarse hair. *Corolla* longer than the calyx, narrowly campanulate, with 5 ovate acute lobes, hairy like the calyx. *Anthers* 5, sessile, oblong, blunt, included. *Style* shorter than the calyx; stigmas short, linear, divergent. *Fruit* crowned by the small calyx-lobes, reniform, pale with numerous short vertical brown streaks, and stiff short white hairs, ·1 in. broad and less in length; the dorsal surface of each of the two

cartilaginous cocci with 3 bold ridges. *Seeds* bluntly 5-ridged on the dorsal, broadly grooved on the ventral surface. DC. Prod. IV. 520; Hook. fil. Fl. Br. Ind. III. 169. *P. microcarpa*, Wall. Cat. 8344. *Streblosa tortilis*, Korth. Kruidk. Arch. II. 246.

PENANG: *Wallich* 8344; *Curtis* 405, 1269. SINGAPORE: *Lobb.* PERAK: *King's Collector* 710, 2627; *Scortechini.*—DISTRIB. Sumatra, *Forbes* 1495.

15. PSYCHOTRIA GRIFFITHII, Hook. fil. Fl. Br. Ind. III. 171. A shrub; glabrous except the puberulous inflorescence; young branches thinner than a goose-quill, terete, of a dark colour when dry. *Leaves* coriaceous, oblong or elliptic, shortly and somewhat abruptly acuminate, the base cuneate, the edges slightly recurved and pale, both surfaces drying olivaceous-green, shining, the midrib and the 12 to 15 pairs of curved spreading main-nerves distinct; length 6 to 10 in.; breadth 1·75 to 3·5 in.; petiole ·4 to ·8 in., slightly winged above, stout. *Stipules* broadly triangular, sub-acute, ·2 to ·3 in. long. *Cymes* terminal, solitary, pyramidal, about 1·5 in. long and the same in breadth, on naked compressed peduncles 1·5 in. or more long (lengthening to 2 in. or more in fruit); branches short, stout, puberulous, ebracteolate; the ultimate ones bearing the shortly pedicelled flowers in cymules of three. *Flowers* ·2 in. long. *Calyx* campanulate, with 5 broadly triangular acute sub-erect teeth. *Corolla* as long as the calyx, fleshy, tubular, with 5 broad oblong hooded lobes; the tube finely sericeous inside, otherwise glabrous. *Anthers* 5, broadly oblong, entire, dorsifixed; the filaments thin, compressed, broad. *Style* short, with 2 broad flat lobes. *Fruit* elliptic, slightly obovoid, the apex subtruncate, crowned by the remains of the disk and calyx, glabrous, black when dry, ·4 in. long and ·35 in. broad; with 4 broad vertical ridges, two of them grooved externally and consisting of two ridges united, the other two single; 2-celled, and 2-seeded. *Seeds* large, the dorsal surface with a single ridge, the ventral flat, not grooved, everywhere smooth.

MALACCA: *Griffith* (K.D.) 3044; *Maingay* (K.D.) 918; *Hervey; Derry* 367. PERAK: *Ridley* 2873. SINGAPORE: *Ridley* 2872, 2873, 6314, 6468, 6556; *Hullett* 848.

16. PSYCHOTRIA ANGULATA, Korth. in Ned. Kruidk. Arch. II. 243. A shrub 4 to 6 ft. high, glabrous except the inflorescence; young branches pale brown when dry, thinner than a goose-quill, terete. *Leaves* coriaceous, oblanceolate to oblanceolate-elliptic, the apex shortly and rather abruptly acuminate, the base much narrowed; both surfaces brown when dry, tinged with olivaceous; the upper very shining, the broad midrib and nerves depressed; the lower less shining, the midrib

very prominent, and the 8 to 10 pairs of spreading nerves thin but distinct; length 4 to 6 in.; breadth 1 to 1·75 in.; petiole ·2 to ·5 in., slightly winged near the apex. *Stipules* broadly triangular, acute, subacute or bifid, ·25 in. long. *Cyme* solitary, terminal, pyramidal, about 1·5 in. long, on a naked peduncle 1·25 to 3 in. long; branches whorled, shortly bracteolate at their bases, spreading; the ultimate branchlets crowded at their ends with numerous sessile flowers ·25 in. long. *Calyx* pale, widely cupular, ·05 in. long, with irregular small teeth. *Corolla* thick, tubular, its 5 broad lobes with acute inflexed apices; the throat densely sericeous. *Anthers* elliptic, blunt, on short filaments. *Fruit* ovoid or narrowly obovoid, pulpy, obscurely ridged, glabrous, crowned by the small calyx, ·5 in. long and half as much broad (unripe), 2-celled. *Seeds* 2, plano-convex. Miq. in Ann. Mus. Lugd. Bat. IV. 210; Hook. fil. Fl. Br. Ind. III. 172. *Psychotria*, Wall. Cat. 8348. *Chasalia perforata*, Miq. Fl. Ind. Bat. Suppl. 546.

Malacca: *Griffith* (K.D.) 3037. Province Wellesley: *Ridley* 7026. Johore: *Ridley* 11161. Singapore: *Ridley* 2867. Pahang: *Ridley* 1353. Penang: *Curtis* 14, 726; *King's Collector* 1683. Perak: *King's Collector* 4170.—Distrib. Burma.

17. Psychotria Helferiana, Kurz in Journ. As. Soc. Beng., 1872, II. 314. A shrub; the whole plant more or less rusty-pubescent; young branches as thick as a goose-quill or thicker, the pubescence dense and deciduous. *Leaves* thickly membranous, elliptic or oblong-elliptic, rarely obovate-elliptic, the apex acuminate, the base usually cuneate but sometimes rounded; both surfaces dark brown when dry, the lower somewhat tinged with red and less hairy than the upper; the hairs on both adpressed and very numerous on the stout midrib, less so on the 9 to 16 pairs of spreading curved main-nerves; length 6 to 12 in.; breadth 2·5 to 4·5 in.; petioles 1 to 1·75 in. *Stipules* broadly ovate to oblong-lanceolate, often as much as 1 in. long, the apex acuminately bifid. *Flowers* ·2 in. long, numerous, mixed with many unequal bracteoles mostly longer than themselves, all acuminate and some of them bifid and crowded in dense pedunculate capitula in a few-branched axillary cyme usually shorter than the leaf-petioles. *Calyx*-tube narrowly campanulate, with 5 lanceolate erect lobes nearly as long as itself, everywhere pilose. *Corolla* similar to the calyx, but smaller and less hairy. *Stamens* almost sessile; anthers broad, blunt. *Fruit* ovoid or ellipsoid, somewhat compressed and boldly 8-ridged, crowned by the lobes of the calyx, ·3 in. long and ·2 in. in diam. Kurz For. Fl. Burm. II. 11: Hook. fil. Fl. Br. Ind. III. 172.

Singapore: *Wallich* 8368; *Goodenough* 184; *Maingay* (K.D.) 921. Malacca: *Maingay* (K.D.) 921; *Ridley* 184; *Lobb*. Johore: *Ridley*

11159; *King; Hullett* 507. PERAK: *King's Collector* 4345, 4661. —DISTRIB. Burma.

VAR. *diffusa*, King & Gamble. *Capitula* in spreading pedunculate panicles several inches in diam.

PERAK: *Scortechini* 400. JOHORE: *Ridley* 3732. SINGAPORE: *Hullett.*

VAR. *angustifolia*, King & Gamble. *Leaves* elliptic-oblong or oblong, not more than 2 in. in width; capitulum solitary, sessile.

SINGAPORE: *King.*—DISTRIB. Andamans.

VAR. *glabra*, King & Gamble. *Leaves* glabrous.

PERAK: *Wray* 1963.

18. PSYCHOTRIA MONTANA, Blume Bijdr. 960. A stout glabrous shrub; young branches half as thick as a goose-quill, angled, brown when dry. *Leaves* thinly membranous, on rather long petioles, elliptic or elliptic-oblong, acuminate, the base cuneate; both surfaces greenish or olivaceous-brown when dry, the lower the paler; main-nerves 7 to 8 pairs (rarely 10 pairs) curving upwards, pale and bold like the midrib on the lower surface, faint on the upper; length 5 to 8 in.; breadth 1·75 to 3·5 in.; petioles ·4 to 1·25 in., winged near the apex. *Stipules* connate by their short broad bases, the apices caudate-acuminate, curved. *Cymes* terminal, paniculate, on angled peduncles ·5 to 1·25 in. in length; branches spreading, angled, bearing numerous shortly pedicelled flowers in cymules of three. *Flowers* ·25 in. long. *Calyx* cupular with 5 broad spreading triangular teeth. *Corolla* with sub-campanulate tube having a broad band of hairs inside in the upper half; the lobes of the mouth 5, broad, acute, reflexed. *Fruit* ellipsoid-ovoid to ellipsoid, boldly 4-ridged, glabrous, ·25 to ·3 in. long. *Seeds:* the dorsal surface with a single ridge, the ventral deeply concave, grooved. DC. Prod. IV. 521; Hook. fil. Fl. Br. Ind. III. 174. *P. viridissima*, Kurz in Journ. As. Soc. Beng. 1872, II. 315; For. Fl. Burm. II. 13. *Chasalia montana*, Miq. Fl. Ind. Bat. II. 281. *C. expansa*, var. *montana*, Miq. MS. *Psychotria*, Wall. Cat. 8371, 8378, and *Rubiaceæ*, 8339. *Coffea tabaccifolia*, Wall. Cat. 8334.

PERAK: *Scortechini; Ridley*, 2922; *King's Collector*, 452, 2190; *Wray* 276.—DISTRIB. Sumatra, *Forbes* 1566, 1862, 2201, 2241, 2330. JAVA: *Blume; Forbes* 271, 759, &c. Burma; Assam; Sylhet (*Griffith*, K.D.) 3047.

VAR. *brevipetiolata*, King & Gamble. *Leaves* with petioles ·2 to ·4 in. long.

PERAK: *Scortechini* 277, 1513; *Wray* 1628, 2289; *King's Collector* 389, 922, 1954, 2190, 4707, 6111, 8596. SELANGOR: *Ridley* 10583. PAHANG: *Ridley* 5831. MALACCA: on Mt. Ophir, *Hullett* 762

19. Psychotria viridiflora, Reinw. ex Blume Bijdr. 965. A small tree or a bush, all parts, except the inflorescence, glabrous; young branches thinner than a goose-quill, dark brown. *Leaves* membranous, oblong-elliptic to oblanceolate-elliptic, shortly and stoutly acuminate, the base much narrowed; both surfaces brown when dry; main-nerves 8 to 14 pairs, curved, spreading, rather faint on both surfaces; length 3·5 to 8 in.; breadth 1·25 to 2·5 in.; petiole ·4 to ·75 in. occasionally as much as 1·25 in. long. *Stipules* broadly oblong, narrowed to the apex, but not acute, ·3 to ·5 in. long, deciduous. *Cymes* on naked peduncles (·3 to 1·5 in. long) in broad panicles 1 to 2 in. long and as much wide (more when in fruit); branches divaricating, puberulous, with small broad bracteoles. *Flowers* in small cymes, on the ultimate branches, ·1 in. long, on short pedicels, glabrous outside. *Calyx* cupular with irregular, short, sharp teeth. *Corolla* longer than the calyx, widely tubular, with 5 broad sub-acute lobes; the throat sericeous. *Anthers* 5, oblong, blunt, attached by short filaments in the throat. *Fruit* elliptic, with a wide shallow areola on the apex, the sides with 10 bold vertical ridges (2 of them double), glabrous, about ·25 in. long and ·2 in. in diam. *Seeds* plano-convex, the convexity deeply 5-grooved, the ventral surface flat. *P. sulcata*, Wall. Cat. 8370; Hook. fil. Fl. Br. Ind. III. 168. *P. Jackii*, Hook. fil. Fl. Br. Ind. III. 167.

Malacca: *Griffith* (K.D.) 3021; *Goodenough* 1878; *Derry* 457, 1224; *Ridley* 1600. Pangkore: *Curtis* 1369. Trang: *Wray* 2778. Negri Sembilan: *Ridley* 1930. Selangor: *Ridley* 7434. Perak: *Scortechini; Ridley* 2919, 3067; *Wray* 290, 2027, 2778, 2956; *King's Collector* 2655, 4275, 4374, 5964, 6327, 7224. Penang: *Wallich* 8343, 8370.—Distrib. Burma, *Helfer* & *Griffith* (K.D.) 3040; Sumatra, *Forbes;* Java, *Blume;* Borneo, *Beccari; Motley; Haviland.*

20. Psychotria Birchiana, n. sp., King & Gamble. Herbaceous; woody at the base; all parts softly rusty-pubescent; stems 6 to 18 in. high, thinner than a goose-quill, their pubescence crisped, dense, coarse, and entirely or partly deciduous. *Leaves* thickly membranous, elliptic to elliptic-oblong, sometimes sub-obovate, acute, the base rounded or minutely cordate or sometimes cuneate; both surfaces brown when dry, the lower sometimes paler and with fewer hairs; the midrib prominent and very hairy on both sides, the 10 to 12 pairs of rather faint little-curved spreading main-nerves less hairy than the midrib; length 3·5 to 5 in.; breadth 1·5 to 2·25 in.; petiole ·5 to 1 in., covered with coarse tomentum mixed with ovate-acuminate scales. *Stipules* oblong-ovate, acuminate, ·5 to ·75 in. long. *Cymes* pedunculate, solitary, terminal, spreading, 1·5 to 2 in. across, and about as long, the branches spreading, bracteate at the divisions, the bracts lanceolate,

acute, reflexed, ·2 or ·3 in. long; the peduncle 1·5 to 2·5 in. long, scaly, tomentose; ultimate branches short, bearing at their apices dense capitules of small sub-sessile flowers, mixed with short broad bracteoles. *Flowers* about ·1 in. long. *Calyx* cupular-campanulate, pubescent; the mouth wide and with 5 blunt, triangular, spreading lobes. *Corolla* exceeding the calyx, widely tubular, with 5 or 6 short inflexed teeth, glabrous inside, hairy outside. *Anthers* oblong, blunt at each end, the filaments short. *Fruit* ellipsoid, tapering equally to each end, boldly 10-ridged, somewhat compressed, crowned by the hairy calyx-lobes, otherwise sub-glabrous, ·25 to ·3 in. long and ·2 in. across. *Seeds* with 5 dorsal ridges, the ventral surface plane.

PERAK, on Birch's Hill, elev. 4,000 feet: *Scortechini* 258; *Wray* 1; *King's Collector* 2134, 2950, 7348. SELANGOR: *Ridley* 7432.

The flowers are described as white, and the ripe fruit as cherry red. Named in honour of Mr. Birch, a British civil officer, who was murdered by the aborigines in Perak.

21. PSYCHOTRIA FULVA, Buch.-Ham. ex. Wall. Cat. 8366, excl. B. A shrub; young branches thinner than a goose-quill, dark brown when dry, bearing a few scattered coarse hairs. *Leaves* thickly membranous, elliptic, shortly acuminate and tapering almost equally to the base; upper surface without hairs except a few on the midrib near the base, under surface with dark cinereous pubescence on the midrib and 15 to 18 pairs of sub-horizontal slightly curved main-nerves; length 5 to 7 in., breadth 1·75 to 3·5 in.; petioles 1·25 to 2·4 in., coarsely and deciduously pubescent. *Stipules* membranous, broadly oblong, the apex deeply and acuminately bifid, the edges coarsely ciliate; length about 1 in. *Cymes* pedunculate, axillary, trichotomous, the flowers in condensed capitular cymes at the ends of the short branches, enveloped when in bud in 2 or 3 large deciduous bracts; in fruit about 2 in. across and less in length; peduncles about 2 in. long; branches about ·5 in. long, horizontal; all, like the short flower pedicels, coarsely rusty-pubescent. *Calyx* cupular, with 5 deep, spreading, narrow, acuminate lobes. *Corolla* not seen. *Fruit* narrowly elliptic, somewhat compressed, tapering slightly to each end, the apex crowned by the erect connivent calyx-lobes, boldly but somewhat unequally 12-ridged, glabrous, ·45 in. long and ·25 in. in diam. *Seeds* 5-ridged on the dorsal, the ventral surface flat. Hook. fil. Fl. Br. Ind. III. 169, excl. syn. *P. monticola*, Kurz. *Psychotria*, Wall. Cat. 8337; Griff. Notulæ, IV. 268; Ic. Pl. Asiat. t. 479, f. 2.

PERAK, On Ulu Batung Padang: *Wray* 1615.—DISTRIB. E. Bengal, *Griffith* (K.D.) 3022, 3034, 3035, 3036; Khasia, *Hook f. & Thoms.* 14.

P. monticola, Kurz, a Burmese plant, has been reduced to *P. fulva*, Buch.-Ham., but in my opinion it is quite distinct.

22. PSYCHOTRIA FULVOIDEA, n. sp., King & Gamble. A small shrub; young branches thinner than a goose-quill, dark-coloured, glabrous. *Leaves* membranous, narrowly elliptic, acuminate, crenulate, the base cuneate; upper surface glabrous, dark brown when dry, the lower reddish-brown; the midrib, nerves and reticulations rusty-pubescent, otherwise glabrous; midrib prominent on both surfaces, the 10 to 14 pairs of spreading, curving main-nerves slightly prominent on the lower; length 6 to 7 in.; breadth 2 to 2·5 in.; petiole 1 to 1·3 in. *Stipules* membranous, ovate, caudate-acuminate, the edges irregularly serrate, ciliate, length about 1 in. *Cymes* axillary, trichotomous, condensed, about 2 in. broad when in fruit and 1·25 in. long, on deflexed, coarsely but shortly pubescent peduncles 3 in. long; their branches short, spreading, bracteate at the divisions and coarsely pubescent. *Flowers* condensed into globose capitulate cymes at the apices of the branches, sessile. *Calyx* narrowly campanulate, pubescent, with 5 erect acute teeth. *Corolla* unknown. *Fruit* narrowly elliptic, tapering to each end, the apex crowned by the short pubescent lobes, with 12 deep ridges and grooves, glabrous, ·4 in. long and ·2 in. in diam. *Seed* dorsally 5-ridged, ventrally 2-grooved.

PERAK: *Scortechini* 538.

This approaches *P. fulva*, but is a smaller plant, with crenulate leaves quite glabrous on the upper surface and nearly so on the lower.

23. PSYCHOTRIA STIPULACEA, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 164. A shrub, 1 to 2 feet high, all parts except the inflorescence glabrous; stems as thick as a goose-quill, brown when dry. *Leaves* membranous, broadly oblanceolate to elliptic, or oblong, abruptly and shortly acuminate, much narrowed to the base; both surfaces glabrous, when dry brown with a reddish tinge; midrib very stout, main-nerves 11 to 13 pairs, spreading, slightly curved, distinct on both surfaces; length 5 to 9 in.; breadth 2 to 4 in.; petioles ·5 to 1·25 in. long, winged near the apex. *Stipules* large, sub-persistent, ovate, sometimes bifid, ·75 to 1 in. long, and about ·4 in. broad. *Cyme* usually solitary, corymbose, trichotomous, terminal, on a short peduncle, bracteate at the base, about 2 to 3 in. in diam.; its branches puberulous, bracts and bracteoles triangular. *Flowers* ·15 in. long, on short pedicels, clustered in dense, cymose, capituliform cymes at the ends of the ultimate branches. *Calyx* campanulate, with 5 broad pubescent lobes, the tube glabrous. *Corolla* longer than the calyx, widely campanulate, 4- or 5-toothed. *Fruit* ellipsoid, sub-compressed, 10-ridged, crowned by the small calyx, ·3 in. long, and ·15 in. in diam. *Seed* dorsally 5-ridged, ventrally concave, with one central ridge. Wall. Cat. 8329; DC. Prod. IV. 519; Hook. fil. Fl. Br. Ind. III. 167.

PENANG: *Wallich* 8329; *Curtis* 732. TRANG: *Kunstler* 1382. PAHANG: *Ridley* 2216. PERAK: *Ridley* 2918; *King's Collector*, 1357, 1382; *Wray* 3440; *Scortechini* 278, 307, 558, 692.—DISTRIB. Sumatra.

24. PSYCHOTRIA CURTISII, n. sp., King & Gamble. A shrub, 6 feet high; young branches thinner than a goose-quill, rusty-pubescent. *Leaves* elliptic, sometimes somewhat obovate, tapering equally to each end, shortly acuminate, the base cuneate; both surfaces olivaceous-brown when dry, the upper glabrous or with a few hairs on the midrib near the base, the lower rusty-puberulous between the 9 or 10 pairs of bold, shortly and densely rusty-pubescent curved ascending main-nerves; length 5 to 8 in.; breadth 1·5 to 3 in.; petioles ·5 in., densely rusty-pubescent. *Stipules* caducous. *Cyme* solitary, terminal, 3-branched, on a pubescent peduncle from ·3 to ·5 in. long (much longer in fruit), branches bearing 3 to 5 sessile flowers in capitula at their apices; bracteoles linear. *Flowers* ·25 in. long, rusty-pubescent. *Calyx* half-superior, campanulate, the mouth with 5 long, spreading, ovate-acuminate lobes. *Corolla* longer than the calyx, salver-shaped, with 5 oblong lobes. *Fruit* ovoid, tapering to the apex, crowned by the long lobes of the calyx, the sides puberulous, 10-ridged. *Seeds* with 4 ridges on the dorsal surface, the ventral plane.

PENANG: *Curtis* 2695.

25. PSYCHOTRIA RHINOCEROTIS, Reinw. ex Blume Bijdr. 961. A shrub; young branches thinner than a goose-quill, at first rusty-tomentose, afterwards glabrescent and pale brown. *Leaves* coriaceous, obovate-oblong or obovate-oblanceolate, the apex broad, but usually with a small abrupt apiculus, the base cuneate; upper surface olivaceous, glabrous, the lower brown and softly and finely rusty-pubescent; the midrib broad, more prominent on the upper than on the lower surface; main-nerves 10 to 14 pairs, slightly curved, oblique, distinct on both surfaces; length 3 to 5 in.; breadth 1·35 to 2·5 in.; petiole ·2 to ·6 in., stout. *Panicle* solitary, terminal, 1·5 in. long and slightly wider; branches few, lax, divaricate, cymosely few-flowered. *Fruit* elliptic-ovoid, slightly compressed, with 10 vertical grooves (2 of them double), crowned by the rather broad, bluntly 5-toothed calyx, acutely 10-ridged (2 ridges double), pubescent between the ridges; length ·25 in.; breadth ·2 in. *Seeds* dorsally 4-ridged, ventral surface plane. Miq. Fl. Ind. Bat. III. 292; DC. Prod. IV. 521; Korth. Kruidk. p. 242.

PERAK: *King's Collector* 8272; *Scortechini*.

26. PSYCHOTRIA MALAYANA, Jack in Mal. Misc. I. 3; reprinted in Calc. Journ. Nat. Hist. IV. (1843), p. 26. A shrub; young branches

rather thinner than a goose-quill, sub-terete, glabrous, rather pale brown when dry. *Leaves* coriaceous, elliptic or broadly elliptic-lanceolate, shortly and abruptly acuminate, much narrowed to the base; upper surfaces glabrous, brown, shining when dry, the lower dull and sparsely pubescent, often tinged reddish, the edges slightly recurved; main-nerves 12 to 18 pairs, ascending, little curved, bold on the lower surface and faint on the upper; length 5 to 10 in.; breadth 2·5 to 4·5 in.; petioles ·4 to 1·5 in. *Stipules* broadly ovate, blunt, about ·35 in. long. *Cyme* terminal, on an angled, sub-compressed peduncle ·5 to 1 in. long (lengthening in fruit), the branches corymbose, whorled, many-flowered; ultimate cymules 3-flowered. *Flowers* ·5 in. long, 2 on each cymule, on short pedicels (the middle one sessile), minutely bracteolate at the base. *Calyx* under ·1 in. long, tubular, the truncate mouth minutely 5-toothed. *Corolla* tubular, ·4 in. long, with 5 oblong sub-acute lobes; the throat villous inside. *Fruit* ·4 in. long and ·3 in. in diam., elliptic-ovoid, vertically 10-ridged, the apex with very slight remains of the calyx. *Seeds* faintly 4-ridged on the dorsal, the ventral surface plane with a faint central groove. DC. Prod. IV. 520. *P. aurantiaca*, Wall. in Roxb. Fl. Ind., ed. Carey & Wall., II. 165; Blume Bijdr. 962; Wall. Cat. 8335. *Grumelia aurantiaca* and *Chasalia expansa*, Miq. Fl. Ind. Bat. II. 296 and 281.

SINGAPORE: *Ridley* 6468, 8422; *Hullett* 904. PAHANG: *Ridley* 2197. PERAK: *King's Collector* 6327, 7168; *Wray* 2956; *Scortechini* 307.—DISTRIB. Borneo, Java.

The corolla of this is larger than that of any other Malayan species of *Psychotria*, being about ·4 in. long when dry.

SPECIES IMPERFECTLY KNOWN.

27. PSYCHOTRIA WRAYI, n. sp., King & Gamble. A small shrub, glabrous except the inflorescence; young branches as thick as a swan's-quill, terete, dark-coloured when dry. *Leaves* coriaceous, oblanceolate-elliptic, shortly acuminate, gradually narrowed from about the middle to the short, partially winged petiole; both surfaces dark olivaceous-brown when dry, the midrib rather prominent; main-nerves 13 to 15 pairs, oblique, almost straight, thin but pale and rather distinct on the lower surface, indistinct on the upper; length 6 or 7 in.; breadth 2 to 2·5 in.; petiole about ·5 in., winged above. *Stipules* broadly ovate, sub-acute, the edges coarsely ciliate, ·5 in. long. *Cymes* terminal, on short peduncles, bracteate at the base, umbelliform, widely spreading, about 4 in. broad and only half as long; the branches 4-angled, sub-compressed, pubescent, divergent. *Flowers* crowded at the extremities of the branchlets, ·25 in. long, on short thick pedicels. *Calyx* deeply

cupular, with 5 broad, shallow blunt teeth. *Corolla* much longer than the calyx, widely tubular; lobes 5, blunt, broadly ovate, reflexed, the throat with a little short hair. *Anthers* 5, narrowly elliptic, blunt, on short filaments, almost basifixed, exserted by the reflexion of the lobes of the corolla. *Fruit* unknown.

PERAK: *Wray* 3959; *King's Collector* 2755.

28. PSYCHOTRIA INÆQUALIS, n. sp., King & Gamble. A small unbranched shrub; the stem thinner than a goose-quill, deciduously puberulous, only a foot high, brown when dry. *Leaves* thickly membranous, those of a pair somewhat unequal in size, elongate-obovate, the smaller one oblong-elliptic, all abruptly and shortly acuminate, the base cuneate; upper surface glabrous, minutely pitted when dry; the lower with many coarse pale-brown, crisped, flattened hairs on the midrib and nerves, and a few pale appressed hairs on the interspaces; midrib broad and channelled on both surfaces, as are also the 10 to 13 pairs of pale ascending, slightly curved main-nerves; length 6 to 10 in.; breadth 2·5 to 5 in.; petiole ·5 to ·75 in., stout. *Stipules* narrowly ovate, acuminate, pubescent, ·65 in. long. *Cyme* solitary, terminal, 2 to 3·5 in. long (including the 1 to 2 in. peduncle), pyramidal, everywhere rusty-puberulous, the branches opposite, many-flowered, and with broad abruptly acuminate bracts; the lowest pair exceeding 1 in. in length, reflexed; branchlets divaricate. *Flowers* ·1 in. long, on short stout pedicels. *Calyx* small, tubular; its lobes broadly triangular. *Corolla* not much longer than the calyx, its lobes linear with moniliform bluish hairs at their bases and on the throat. *Fruit* unknown.

PERAK: *Scortechini* 279.

29. PSYCHOTRIA CONDENSA, n. sp., King & Gamble. A small woody shrub; young branches half as thick as a goose-quill, the nodes close together and slightly thickened, the internodes striate, at first scurfy-puberulous but afterwards glabrous. *Leaves* coriaceous, narrowly elliptic or elliptic-lanceolate, shortly acuminate, the base cuneate; upper surface when dry very dark brown, the lower paler and tinged with olivaceous, the midrib prominent and pale; the 5 or 6 pairs of oblique main-nerves visible beneath but not above; length 1 to 1·25 in.; breadth ·3 to ·5 in.; petiole ·05 in. *Stipules* broadly triangular, acuminate, nearly ·1 in. long. *Umbel* cymose, 3-branched, terminal, shorter than the leaves; each branch with 3 unequally pedicillate flowers. *Flowers* not seen. *Fruit* globular-ovoid, with 2 prominent furrowed vertical ridges and several obscure ones between them, crowned by the 5-toothed calyx; length ·2 in.; breadth ·15 in. *Seeds* with one prominent dorsal ridge, ventral surface flat.

PERAK: *Scortechini.*

Order LX. VALERIANEÆ.

Herbaceous (as regards the Indo-Malayan species). *Leaves* opposite, exstipulate, their bases often connected by an interpetiolar line or ridge; entire, pinnatifid or pinnate. *Flowers* sessile, in cymes, usually hermaphrodite but sometimes polygamous or diœcious, bracteate. *Calyx-tube* adnate to the ovary, the limb in the flower small, in the fruit often enlarged or pappose. *Corolla* superior, gamopetalous, its tube cylindric or gibbous or spurred at the base; the limb with 3 to 5 imbricate lobes, often irregular. *Stamens* 1 to 4, on the tube, usually exserted. *Ovary* inferior with a single perfect, 1-ovuled cell, and 2 barren empty cells; style filiform; stigma 2- or 3-lobed or entire; ovule in the fertile cell pendulous from the apex of the loculus. *Fruit* indehiscent, dry, 1-seeded, the 2 barren cells enlarged or represented by narrow ridges. *Seed* pendulous, with very little or no albumen; embryo straight, radicle superior.—Distrib. About 350 species, in temperate climates; generally diffused, but absent from Australia and South Africa.

Valeriana, Linn.

Perennial herbs. *Leaves* entire, pinnatifid or pinnate, the radical often undivided and with long petioles. *Flowers* in cymes, corymbosely paniculate; bracts small, oblong or linear, free or nearly so, persistent. *Calyx-limb* in flower obsolete, in fruit developing into a ring of from 5 to 15 feathery bristles, united at their bases into a short funnel-shaped tube. *Corolla*-tube funnel-shaped, its base often sub-gibbous; limb with 5 spreading lobes, both tube and limb pink or white. *Stamens* 3. *Ovary* 3-celled, only 1 cell containing 1 ovule; stigma sub-entire or shortly 3-fid. *Fruit* oblong, plano-convex, with 6 ribs, 1-celled; the 2 barren cells obsolete, crowned by the persistent pappose calyx. —Distrib. About 180 species in moist temperate regions.

Valeriana Hardwickii, Wall. in Roxb. Fl. Ind., ed. Carey & Wall. I. 166. *Root* fibrous. *Stem* erect, 1 to 3 feet high, pubescent below, mostly glabrous upwards but pilose or barbate at the nodes. Radical *leaves* ovate, acute, on long petioles; stem *leaves* unequally pinnatifid, the segments 3 to 5, the upper the longest, all lanceolate or ovate-lanceolate and irregularly toothed. *Panicles* lax, often as much as a foot long, the branches dichotomous, with small subulate bracteoles at the forks; fruit hairy. Wall. Cat. 432, Pl. As. Rar. 39, t. 263; Don Prod. Fl. Nep. 159; DC. Prod. IV. 640; Clarke in Hook. fil. Fl. Br. Ind. III. 213. *V. Hardwickiana*, Roem. & Schult., Syst. I., Mant. 259. *V. tenera*, Wall. Cat. 435; DC. Mem. Valer. 16; Prod. IV. 640.

V. elata, Don Prodr. 159. *V. javanica*, Blume Bijdr. 919. *V. acuminata*, Royle Ill. Him. Bot. 241.

At high elevations on the central ridge in Perak, this is said to occur, but I have seen no specimens.

Order LXI. COMPOSITÆ.

Herbs or shrubs, sometimes scandent, rarely trees. *Leaves* alternate, rarely opposite or whorled; simple or sometimes compound exstipulate. *Florets* numerous, small, aggregated in centripetal heads, sessile on the dilated top of the peduncle (receptacle); the heads surrounded by an involucre of 1- or more-seriate, free or connate bracts; bracteoles none or reduced to paleate scales or bristles on the receptacle; individual florets all tubular (head discoid), or the outer or all ligulate (head rayed); all bi-sexual or the inner bi-sexual or male, the outer female or neuter; sometimes diœcious. *Sepals* connate in a calyx-tube, adnate to the ovary; limb none, or composed of hairs (pappus) or scales. *Petals* connate in a corolla of two forms: (*a*) tubular or campanulate, with 4–5-lobed limb; lobes valvate with marginal nerves; (*b*) ligulate with lobes elongated and connate in a strap-shaped or elliptic ligule. *Disk* epigynous. *Stamens* 4–5, inserted within the corolla-tube; filaments usually free; anthers basifixed, usually connate (syngenesious); connective produced upwards; cells simple or tailed at the base; pollen sub-globose, rough. *Pistil* an inferior 1-celled ovary; ovule solitary, basal, erect, anatropous, nucleus with one coat; style slender, normally 2-fid; the arms (sometimes) connate, linear or sub-terete, naked or pubescent externally or tipped by pubescent cones; the margins stigmatic. *Fruit* a dry indehiscent achene (cypsela). *Seed* erect; testa membranous; albumen none; embryo straight; cotyledons plano-convex; radicle short.—DISTRIB. Universal; genera about 1,000; species about 8,000.

Corollas of all the florets either tubular to near the mouth or the marginal row ligulate; style-arms long, distinct, or very short, or the style sub-entire in the sterile florets of heads with heterogamous florets; stems sometimes woody; leaves alternate or opposite; sap never milky:—

Florets red, purple, or white, never yellow; all similar (homogamous) and tubular, or rarely (*Elephantopus*) cleft laterally; involucre of bracts always more than 1-seriate; pappus present, usually setaceous, receptacle naked or rarely (*Ageratum*) paleaceous:—

Anthers cleft at the base and appendiculate at the apex; style-arms subulate, hairy; leaves alternate (*Vernonieæ*):—

Heads distinct, many-flowered; pappus long, copious, cypselas ribbed .. .. 1. VERNONIA.

Heads 1- or few-flowered, crowded into dense clusters resembling single heads; pappus chaffy .. .. 2. ELEPHANTOPUS.

Anthers sub-entire at the base, either truncate or appendiculate at the apex; leaves opposite at any rate below (*Eupatorieæ*) :—

Anthers truncate at the apex .. .. .. 3. ADENOSTEMMA.

Anthers appendiculate at the apex :—

Pappus paleaceous, receptacle sometimes paleaceous .. 4. AGERATUM.

Pappus of slender hairs; receptacle always naked; bracts of involucre 4 with sometimes a small outer one; scandent .. .. 5. MIKANIA.

Florets, if homogamous and tubular, yellow; if heterogamous, at least those of the disk yellow; or if none of the florets yellow (*Emilia*) then with the bracts of the involucre 1-seriate

Anthers appendiculate at the apex (*Asteroideæ*) :—

Receptacle naked, smooth, or pitted; sometimes, when pitted, the edge of the pit fimbriate :—

Bracts of involucre in two rows :—

Anthers sub-entire at the base; florets all tubular, those of the disk purple, of the ray filiform, yellowish or white; pappus none or of 2 bristles; heads small in lax panicled cymes, bracts of involucre in two series; erect herbs .. .. .. 6. DICHROCEPHALA.

Bracts of the involucre many-seriate, leaves alternate :—

Anthers obtuse and entire at the base; florets of disk tubular with wide limb; those of the ray filiform-tubular or tubular only at the base, expanding into small yellowish ligules; pappus copious and silky; heads in dense corymbose panicles; climbers .. 7. MICROGLOSSA.

Anthers cleft at the base; style-arms of hermaphrodite flower filiform, linear, or obtuse, or those of the sterile flowers undivided (*Inuloideæ*) :—

Flower-heads medium-sized; separate, solitary, or in corymbose or paniculate cymes, not in globose clusters, if clustered the cypselas with copious soft pappus :—

Herbs; bracts of involucre narrow; flowers not corymbose :—

Anther-cells tailed at the base, the tails of adjacent anthers confluent .. .. 8. BLUMEA.

Anther-cells sagittate at the base, not tailed or connate.. .. .. .. 9. LAGGERA.

Shrubs; bracts of involucre broad; flowers corymbose .. .. 10. PLUCHEA.

Flower-heads small, clustered in dense ovoid or globose masses; herbs with winged stems; pappus none .. .. 11. SPHÆRANTHUS.

Bracts of the involucre 1-seriate, sub-equal, free or united, with sometimes a few short outer bractlets (*calyculus*) at their bases; heads homogamous; anther-cells sub-entire at the base; receptacle naked (*Senecionidæ*):—

Leaves alternate; pappus of fine hairs, style-arms of hermaphrodite flowers truncate or obtuse, penicillate or with a hairy tip:—

Heads ebracteate; florets purple .. .. 12. EMILIA.

Heads bracteolate; florets yellow .. .. 13. GYNURA.

Receptacles paleaceous; anthers sub-entire at the base; bracts of involucre 1- to many-seriate; heads usually radiate, heterogamous; style-arms truncate or appendiculate, or those of the sterile florets entire; pappus of 2 to 4 arms or paleaceous or absent; leaves at the base of the stem usually opposite, those higher up opposite or alternate (*Helianthoideæ*):—

Pappus of only 4 bristly awns, or cup-like or absent:—

Cypselas all thick, or those of the ray-florets 3-angled and those of the disc laterally compressed; pappus cup-like or composed of 2 to 3 stiff chaffy or bristly arms, with or without intermediate smaller scales or altogether absent; leaves usually opposite:—

Inner bracts of the involucre embracing and enclosing the cypselas of the fertile ray-florets; pappus absent, outer bracts of involucre 5, glandular .. .. 14. SIEGESBECKIA.

Inner bracts of the involucre all flat, scales of receptacle flat, very narrow, usually few; disk-florets 4–5-fid, ligules small; pappus absent, or if present shortly 2-awned; outer bracts of involucre numerous .. .. .. 15. ECLIPTA.

Scales of the receptacle concave or complicated more or less enclosing and embracing the disk florets:—

Cypselas not winged, compressed or 3–5-angled, ray-florets yellow with large ligules; disk-cypselas with 1 or 2 short deciduous awns; leaves all opposite .. .. 16. WEDELIA.

Cypselas of the disk-florets ciliate, winged on the margins, laterally compressed; heads small; leaves always opposite .. .. .. 17. SPILANTHES.

Cypselas more or less depressed from the top; pappus of 2 (rarely 3 or 4) bristles or absent:—

Outer bracts of the involucre almost equal; herbaceous; inner bracts separate, almost resembling the scales of the receptacle; ray-florets fertile; leaves opposite:—

Cypselas flat, their margins lacerate and winged; pappus composed of bristles .. .. 18. SYNEDRELLA.

Outer bracts of the involucre few, small; inner bracts connate below, membranous:—

Cypselas not beaked; leaves opposite, simple to pinnatisect .. .. 19. BIDENS.
Pappus of membranous scales; heads radiate; leaves opposite:—
Scales of pappus feathery, fringed; heads medium-sized .. .. 20. TRIDAX.
Anthers inappendiculate at the apex; receptacle (in our species) not paleaceous; pappus absent or reduced to a raised rim, rarely scaly and short; leaves usually alternate (*Anthemideæ*):—
Flower-heads discoid, heterogamous; pappus absent:—
Florets of the circumference very numerous; cypselas flat or concave at the top; flower-heads globose or hemispheric, sub-sessile; bracts of involucre in 2 series, spreading in fruit .. .. 21. CENTIPEDA.
Florets of the circumference few; heads very small, in racemes or panicles; cypselas ellipsoid or obovoid, rounded at the apex .. .. .. 22. ARTEMISIA.
Corollas of all the florets flatly expanded from a tubular base, ligulate, their apices 5-toothed; leaves radical or cauline and alternate, never opposite; stem always herbaceous, fistulose; sap milky (*Cichorieæ*):—
Pappus of simple hair-like bristles, at least in the central florets; florets yellow, cypselas fusiform or oblong, with glabrous or puberulous ribs .. .. .. 23. CREPIS.

NOTE.—The above key is taken mainly from "Bengal Plants," by Lieut.-Col. D. Prain, F.R.S., Superintendent, Royal Botanic Garden, Calcutta.

1. VERNONIA, Schreb.

Herbs, shrubs, climbers or small trees. *Leaves* alternate, penninerved, entire or dentate. *Heads* axillary or terminal, solitary or in cymes or panicles, homogamous; flowers often few, but very rarely solitary. *Involucre* ovoid, globose or hemispheric, as long as or shorter than the flowers; bracts in many series, the inner longest. *Receptacle* naked or pitted, sometimes with short hairs. *Corollas* all equal, tubular, slender; lobes 5, narrow. *Anther-bases* obtuse, sagittate. *Style-arms* subulate, acute, hairy. *Cypselas* striate, ribbed or angled, rarely terete, truncate at the apex; pappus of many hairs, usually in two rows, the inner hairs thin and slender, the outer sometimes stout and compressed, persistent or deciduous.—DISTRIB. About 500 species, mostly American.

A large shrub or small tree; leaves sub-coriaceous; involucral bracts obtuse .. .. 1. *V. arborea.*
Herbaceous annuals; leaves membranous; involucral bracts acuminate:—
Heads few, ·35 in. in diam., in long-peduncled cymes.. .. 2. *V. chinensis.*

Heads numerous, ·2 to ·25 in. in diam., in loose terminal corymbose cymes .. .. 3. *V. cinerea.*

1. VERNONIA ARBOREA, Buch.-Ham. in Trans. Linn. Soc. XIV. 218. A tree, 30 to 60 feet high; young branches as thick as a goose-quill or thinner, at first covered, like the under-surfaces of the leaves and branches of the inflorescence, with short rusty tomentum, sometimes glabrous or glabrescent. *Leaves* sub-coriaceous, entire, elliptic ovate or ovate-oblong, acute or shortly acuminate, the base rounded or cuneate; upper surface glabrous, or nearly so, except the midrib, the reticulations minute and distinct; main-nerves 8 to 14 pairs, spreading, interarching, bold and distinct on the lower surface, more faint on the upper; length 3·5 to 6 in.; breadth 1·75 to 2·75 in.; petioles ·75 to 1·25 in., pubescent. *Heads* 2- to 5-flowered, collected in large open terminal panicles much longer than the leaves. *Involucral bracts* few, small, oblong, obtuse, less than half as long as the flowers, pubescent, concave, persistent. *Corolla* glabrous, bluish. *Cypselas* not conspicuously ribbed, short, truncate; pappus in a single row, tuberculate, white tinged with ochraceous, persistent. DC. Prod. V. 22; Kurz For. Fl. Burm. II. 80; Clarke Comp. Ind. 23; Hook. fil. Fl. Br. Ind. III. 239. *Vernonia javanica*, *Blumeana* and *celebica*, DC. l.c. 21, 22; Miq. Fl. Ind. Bat. II. 9, 10. *Eupatorium celebicum* and *javanicum*, Blume Bijdr. 903. *Conyza acuminata* and *arborea*, Wall. Cat. 3034A and 3074.

MALACCA: *Griffith.* SINGAPORE: *Lobb*; *Ridley* 2735, 2739, 9478; *Maingay* (K.D.) 948, 949, 950. PENANG: *Curtis* 2, 926. NEGRI SEMBILAN: *Ridley* 10087. SELANGOR; *Ridley.* PERAK: *Wray* 2240, 2442; *King's Collector*, many Numbers; *Scortechini.*—DISTRIB. Ceylon, Malay Archipelago, Philippines, China.

2. VERNONIA CHINENSIS, Less. in Linnæa, VI. 674. An erect annual with divaricate, softly puberulous to tomentose, angled branches. *Leaves* alternate, sessile or petiolate, membranous, ovate elliptic elliptic-lanceolate or oblanceolate, narrowed at the base, sub-serrate or entire. *Heads* few, ·35 in. in diam., in lax, few-branched, axillary and terminal, open puberulous cymes, on slender peduncles longer than the leaves, 15- to 30-flowered. *Involucral bracts* not numerous, lanceolate, awned or acute, usually at first pubescent outside, inside glabrous, shining, 1-nerved; longer than the glabrous or glabrescent corollas. *Cypselas* less than 1 in. long, 4- or 5-ribbed, glabrous. *Pappus* scanty, white. Clarke Comp. Ind. 78; Hook. fil. Fl. Br. Ind. III. 235. *V. albicans*, DC. in Wight Contrib. 6; Prod. V. 26 (*in part*). *Cyanopis pubescens* and *C. villosa*, DC. Prod. V. 69. *Conyza chinensis*, Lamk. Dict. II. 83 (not of Linn.). *C. punctulata*, Wall. Cat. 2995. *Eupatorium menthæfolium*, Wall. Cat. *Cynanthillium villosum* and *C. pubescens*, Blume

Bijdr. 889 and 890. *Centratherum chinense*, Less. in Linnæa (1829) 320. *Synanthera*, Wall. Cat. 7136.

PENANG: *J. Scott*; *Curtis* 931; *King*; *Deschamps*; MALACCA: *Cuming*; *Griffith*; *Hullett* 634. SINGAPORE: *King*.—DISTRIB. Malay Archipelago, Philippines.

3. **VERNONIA CINEREA**, Less. in Linnæa, IV. 291, and VI. 673. Herbaceous, erect, 6 to 18 in. high, with more or less minute whitish pubescence everywhere; stems slender, striate. *Leaves* membranous with variable petioles, ovate or lanceolate, sometimes obovate or oblanceolate, the apex obtuse or acute, the edges obtusely or acutely toothed, the base narrowed, both surfaces olivaceous-cinereous when dry, the upper glabrous or nearly so, the lower more or less cinereous-pubescent; length 1·5 to 3 in.; breadth ·3 to ·5 in.; petiole ·1 to ·5 in. (in the lower leaves). *Heads* ·2 to ·25 in. in diam., on 10- to 20-flowered, loose, terminal, long-peduncled, corymbose cymes with divaricate branches; bracts of peduncle very few. *Involucral scales* linear-lanceolate, acuminate or almost awned, shorter than the florets, 1-nerved, ·1 in. long, densely pubescent. *Corolla* pubescent, the tube very narrow lavender. *Cypselas* minute; pappus copious, dirty white, the outer row very short. DC. Prod. V. 24, in Wight Contrib. 6; Wall. Cat. 3008; Hook. fil. Fl. Br. Ind. III. 234; Miq. Fl. Ind. Bat. II. 11; Prain Bengal Plants, 590. *V. conyzoides*, DC. in Wight Contrib. 6; Prod. V. 25. *V. rhomboidea* and *V. montana*, Edgew. in Trans. Linn. Soc. XX. 62. *V. albicans*, DC. in Wight Contrib. 6 (*in part*); Wight Ic. 1076. *V. abbreviata* and *leptophylla*, DC. l.c. 25. *V. laxiflora*, Less. in Linnæa, VI. 646; DC. l.c. 25. *V. physalifolia*, DC. in Wight Contrib. 6; Prod. Fl. Pen. Ind. Or. 24. *V. parviflora*, *linifolia*, and *fasciculata*, Reinw. in Bl. Bijdr. 893. *V. Zollingeriana*, Schultz-Bip. in Miq. Fl. Ind. Bat. II. 16. *V. cyanonioides*, Walp. in Linnæa XIV. 509. *Conyza abbreviata*, Wall. Cat. 3048; *C. bellidifolia*, id. 3047; *cinerascens*, 3062; *incana*, 3046; *linifolia*, 3063; *elegantula*, 3049; *ovata*, 3097, and *sub-simplex*, 3003. *C. cinerea*, Linn. Sp. Pl. 862; Wall. Cat. 3008. *C. prolifera* and *C. heterophylla*, Lam. Encyl. II. 84. *Serratula cinerea*, Roxb. Hort. Beng. 60. *Chrysocoma purpurea*, Forst. Prod. 54. *C. violacea*, Schum. Pl. Guin. 384. *Cyanopis decurrens*, Zoll.

In all the provinces, in waste places near cultivation.—DISTRIB. All tropical countries.

2. ELEPHANTOPUS, Linn.

Perennial rigid herbs. *Leaves* alternate, sessile, penninerved, entire or dentate, mostly radical. *Heads* homogamous, each containing 1 to 5 flowers, and collected into ovoid or globose clusters, surrounded by several large leafy bracts. *Involucre-proper* compressed, its component bracts oblong, acute, about 8, dry, stiff, unequal, alternately flat and conduplicate; receptacle naked. *Flowers* all equally 4-lobed, and cleft on one side, and with the lobes spreading in a somewhat palmate manner. *Anthers* obtusely sagittate at the base. *Style-arms* subulate. *Cypselas* truncate, 10-ribbed; bristles of pappus few, rigid, shining, slender and dilated below or chaffy.—DISTRIB. 10 or 12 species, chiefly tropical American—one cosmopolitan.

ELEPHANTOPUS SCABER, Linn. Sp. Pl., 814. Stems dichotomous, from a few inches to 2 feet high, terete, finely strigose. *Leaves* membranous, the radical ones obovate, oblong to elliptic-oblong, tapering to the short petiole, the edges dentate or crenate, up to 6 in. in length and 1·25 to 2·5 in. broad; the cauline few, smaller, sessile, both sets scabrid on the upper surface and finely strigose on the lower; main-nerves 6 to 8 pairs in the cauline, more numerous in the radical leaves, all slightly prominent on the lower surface. *Collective heads* hemispheric, ·5 to ·75 in. in diam., solitary, terminal, on long peduncles. *Bracts* of the conjoined heads 3, leaf-like, about ·5 in. broad, broadly ovate or reniform, apiculate, nervose and pubescent behind; bracts of the involucre-proper shining, glabrous; pappus of 5 shining tuberculate bristles, dilated at the base. Wall. Cat. 2979; DC. Prod. V. 86; Roxb. Fl. Ind. III. 445; Don Prod. 169; Wight Ic. 1086; Clarke Comp. Ind. 28; Hook. fil. Fl. Br. Ind. III. 242; Prain Bengal Plants, 590.

In all the provinces, in cultivated places.—DISTRIB. In most tropical countries.

3. ADENOSTEMMA, Forst.

Herbs, glandular-pubescent or glabrous. *Leaves* mostly opposite, petiolate. *Heads* homogamous, in lax corymbose cymes; involucre campanulate; its bracts numerous, sub-2-seriate, narrow, herbaceous, sometimes connate; receptacle flat, naked. *Corollas* all equal, tubular, regular, with short tube and campanulate 5-toothed limb. *Anthers* truncate, with glandular apiculus, their bases obtuse. *Style-arms* elongate, dilated near the apex. *Cypselas* obtuse, 5-ribbed, glandular; pappus of 3 to 5 short rigid, often clavate hairs, joined at their bases by a narrow ring.—DISTRIB. Species 5 or 6 American, 1 cosmopolitan.

ADENOSTEMMA VISCOSUM, Forst. Char. Gen. 20. An erect, rarely decumbent annual, slender or robust, glabrous; pubescent or viscidly pubescent. *Leaves* membranous, sessile or petiolate, opposite or the upper alternate, from linear to broadly ovate, acute sub-acute cuneate or cordate at the base, the edges serrate crenate or entire, the upper surface usually smooth but sometimes rugose; length from 2 to 6 in.;

petioles varying in length. *Heads* ·3 to ·4 in. in diam., in lax corymbose, pedunculate cymes. *Involucral bracts* oblong, obtuse or acute, glabrous, glandular or scabrid. *Corollas* white, pubescent near the mouth, styles much exserted, the arms clavate. *Cypselas* usually warted, crowned by a glandular ring, bearing pedicellate lobed glands. DC. Prod. V. 111; Clarke Comp. Ind. 28; Hook. fil. Fl. Br. Ind. III. 242; Prain Bengal Plants, 591.

In all the provinces, but not abundant in any of them.—Distrib. The tropics generally.

In the Flora of British India, III. 242, Sir Joseph Hooker recognises seven varieties of this widely distributed and variable species. And to one or other of these he reduces the following eleven species of De Candolle: *A. fastigiatum*, DC. Prod. V. 111, *A. leiocarpum*, *A. Roylei*, *A. elatum*, *A. latifolium*, l.c. p. 112, *A. macrophyllum*, *A. parviflorum*, *A. reticulatum*, *A. viscosum*, *A. madurense*, *A. erectum*, l.c. p. 113. He also reduces here the following: *Ageratum aquaticum*, Roxb. Fl. Ind. III. 415; *A. strictum*, Bot. Mag. t. 2410; *Lavenia fastigiata*, *macrophylla* and *parviflora*, Blume Bijdr. pp. 905 and 906; and the following Nos. of the Wallichian Catalogue, viz., *Lavenia erecta*, 3218; *carnosa*, 3219; *alba*, 3220; *rugosa*, 3221; *viscida*, 3222.

4. Ageratum, Linn.

Erect herbs. *Leaves* opposite in the lower part of the stem, alternate in the upper. *Heads* in panicles or corymbs, homogamous. *Involucre* narrowly campanulate; its bracts in 2 or 3 series, linear, subequal; receptacle convex, naked or with deciduous scales. *Corollas* all tubular, equal, regular, the limb 5-cleft. *Anthers* with slight apical appendages, their bases obtuse. *Style-arms* elongate, obtuse. *Cypselas* 5-angled; pappus of 5 short, free or connate scales, or of 10 to 20 narrow, unequal scales.—Distrib. About 20 species, all probably American, several introduced in the Tropics of the Old World.

Ageratum conyzoides, Linn. Sp. Pl. 839. Annual, 1 to 2 feet high, everywhere with sparse white, rather soft pubescence. *Leaves* membranous, ovate, sub-acute, the base broad and sub-truncate, sometimes cuneate; the edges coarsely crenate or dentate; both surfaces greenish when dry, the upper sparsely hispid; the lower glabrous, boldly reticulate; main-nerves about 2 or 3 pairs, ascending, curved, the lower one branching; length 1 to 3·5 in. *Heads* ·25 in. in diam., in terminal or axillary corymbose cymes. *Involucral bracts* shorter than the flowers, narrowly lanceolate, acute, 3-nerved, puberulous. *Corollas* pale blue or white. *Cypselas* black; pappus of 5 shining, spreading scales, with broad, often serrate bases. DC. Prod. V. 108; Clarke Comp. Ind. 30; Wall. Cat. 3176; Hook. fil. Fl. Br. Ind. III. 243; Prain Bengal Plants, 591. *A. cordifolium*, Roxb. Fl. Ind. III. 415; Wall. Cat. 3177.

In all the provinces, in cultivated places.—Distrib. The tropics generally.

5. MIKANIA, Willd.

A twining herb (in Indo-Malaya). *Leaves* opposite, petiolate. *Heads* small, in spikes racemes or panicles, homogamous, usually 4-flowered. *Involucre* oblong, its bracts 4, narrow, sometimes with a small outer one; receptacle small, naked. *Corollas* all equal, regular, tubular, the tube narrow; the limb campanulate, 5-fid. *Anthers* appendiculate, the base obtuse. *Style-arms* long, acute. *Cypselas* with truncate apices, 5-angled; pappus with one or more rows of scabrid hairs, often connate at the base.—Distrib. About 60 species, all in the warm parts of America and Africa except the following.

Mikania scandens, Willd. Sp. Pl. 1743. A glabrous or puberulous climber; young branches less than half as thick as a goose-quill, brown and striate when dry. *Leaves* membranous, on long petioles, ovate, acuminate; the base broad, cordate, often almost sagittate, the edges sinuate; main-nerves a single pair, ascending from the base and branching outwards; length 1 to 2 in.; breadth ·6 to 1·25 in.; petioles ·5 to 1 in., slender. *Heads* narrow, 4-flowered, in lax corymbose cymes, on slender peduncles much longer than the leaves, peduncles and branches angled when dry, puberulous. *Scales of involucre* chaffy, narrowly oblong, obtuse. *Cypselas* glabrous; pappus reddish. DC. Prod. V. 199; Clarke Comp. Ind. 34; Hook. fil. Fl. Br. Ind. III. 244; Prain Bengal Plants, 592. *M. volubilis* and *M. chenopodifolia*, Willd. l.c. 1745; DC. l.c. 199 and 201. *Eupatorium scandens*, Linn.; Jacq. Ic. t. 169.

In all the provinces, common.—Distrib. British India, Malay Archipelago, Tropical Africa.

6. DICHROCEPHALA, DC.

Annuals, with alternate toothed lyrate or pinnatifid *leaves*. *Heads* small, heterogamous, globose or hemispheric, not rayed, in panicles; *Outer florets* ♀, in many rows, slender, fertile, rigid, 2–3-toothed or cleft. *Disk-florets* ☿, fertile, narrow, 4- or 5-toothed. *Anthers* with truncate bases. *Style-arms* of ☿ florets short, flattened, the tips lanceolate; pappus none or (in the ☿) of 2 minute bristles.—Distrib. Species 5, Asiatic and African.

Dichrocéphala latifolia, DC. in Guill. Archiv. Bot. II. 518. An annual weed, 12 to 24 in. high, erect or spreading, glabrous pubescent or villous. *Leaves* very variable, ovate lanceolate or obovate, entire pinnatifid or lyrate, with the terminal lobe broadly ovate and coarsely toothed; length 1 to 4 in.; petioles ·25 to 1·25 in. *Heads* about ·15 in. in diam., globose, on pedicels many times longer than themselves, in lax, few-branched, cymose panicles. *Ray-florets* ♀, filiform, obscurely 2–3-toothed, white. *Disk-florets* ☿, 4-cleft, yellow. *Cypselas* very small, smooth, with a callous margin, and often with 2 small bristles. DC. in Wight Contrib. 11, Prod. V. 372; Wight Ic. 1096; Clarke Comp. Ind. 36; Hook. fil. Fl. Br. Ind. III. 245. *D. gracilis* and *D. sonchifolia*, DC. l.c. 371, 372. *Cotula sinapifolia*, Roxb. Hort. Beng. 63, Fl. Ind. III. 437; Wall. Cat. .3237. *C. bicolor*, Roth Cat. Bot. II. 116. *C. latifolia*, Pers. Syn. II. 464. *Grangea latifolia*, Lam. Ill. t. 699. *Hippia bicolor*, Smith in Rees Cyclop. XVIII. *Ethulia integrifolia*, Don Prodr. 182.

PERAK: *Scortechini.*—DISTRIB. British India, tropical and subtropical Asia and Africa.

7. MICROGLOSSA, DC.

Slender shrubs, often scandent. *Leaves* alternate, entire. *Heads* small, heterogamous, collected in large corymbose panicles. *Ray-florets* ♀, in 1 or more series, fertile, the ligule minute, white. *Disk-florets* few or many, ☿, fertile, tubular, with dilated 3- to 4-fid limb. *Involucre* campanulate, composed of several series of narrow bracts, the outer shorter. *Receptacle* flat, naked or nearly so. *Corolla*, the ligulate or ray ones narrow, about as long as the style; those of the disk (the tubular) longer. *Anthers* with obtuse bases, entire. *Style-arms* of the ☿ flattened; their tips long, lanceolate. *Cypselas* angled; pappus hairs numerous, slender, silky, in one or two series, somewhat unequal.—DISTRIB. About 6 species, Asiatic and African.

MICROGLOSSA VOLUBILIS, DC. Prod. V. 320. A sub-scandent shrub; branches half as thick as a goose-quill, ridged, glabrous. *Leaves* membranous, ovate-lanceolate, acuminate, the base cuneate or rounded, the edges obscurely toothed; both surfaces brown when dry, glabrous, the lower sometimes slightly pubescent; main-nerves 4 or 5 pairs, little curved, ascending, prominent beneath; length 1·5 to 2 in.; breadth ·65 to 1·25 in.; petioles ·25 to ·4 in., slender. *Heads* ·35 in. in diam., on short peduncles, crowded in dense corymbose terminal cymes, much longer than the leaves. *Cypselas* compressed, 4-angled, puberulous; pappus copious, reddish, much longer than the minute achenes. Clarke Comp. Ind. 57; Kurz For. Fl. Burm. II. 82; Hook. fil. Fl. Br. Ind. III. 257. *Conyza volubilis*, Wall. Cat. 3057. *Erigeron pyrifolius*, Benth. Fl. Hongk., 176.

PERAK: *Ridley* 2890; *Wray* 2472. PENANG: *Wallich* 3057. —DISTRIB. British India, Burma, Malay Archipelago, China.

8. BLUMEA, DC.

Herbs, annual or perennial, glandular-pubescent or woolly. *Leaves* alternate, rarely entire, usually lobed or toothed. *Heads* in paniculate cymes, rarely in racemes, heterogamous, disciform, yellow or purplish. *Ray-florets* in several series, ♀, fertile, filiform, 2- or 3-toothed. *Disk-florets* ☿, few, fertile, with slender tube and 5-toothed limb. *Involucre* ovoid or campanulate; its bracts in several rows, narrow, acute, herbaceous, the outer smaller; receptacle flat, naked. *Anthers* with sagittate bases produced into small slender tails. *Style-arms* of the hermaphrodite flower flattened or filiform, rarely connate with the nearest anthers. *Cypselas* small, sub-terete or angular, with or without ridges; pappus hairs in a single row, slender, often caducous. —DISTRIB. About 60 species, in tropical and sub-tropical Asia, Africa, and Australia.

Scandent ; pappus white	1. *B. chinensis.*
Large shrub ; pappus red	2. *B. balsamifera.*
Erect herbs ; pappus white :—	
Heads in small sessile clusters of 2 or 3 in the axils of small bracts on an elongated pseudo-spike	3. *B. glomerata.*
Heads few (1 to 6), in short, axillary, condensed, pedunculate cymes ; leaves oblanceolate or obovate, dentate but not lobed ; flowers purple	4. *B. Wightiana.*
Heads sessile or sub-sessile, in lax, shortly-branched, leafy cymose panicles ; leaves oblanceolate, dentate but not lobed ; flowers yellow	5. *B. lacera.*
Heads sessile or sub-sessile, in axillary spikes several inches long, arranged in a pseudo-panicle ; leaves oblanceolate, dentate and sometimes lobulate ; flowers yellow	6. *B. membranacea.*

1. BLUMEA CHINENSIS, DC. Prod. V. 444. Scandent; young branches half as thick as a goose-quill, glabrous, much striate and dark brown when dry. *Leaves* membranous, elliptic or oblong-elliptic, acuminate or acute, narrowed to the rounded base, the edges with remote, narrow, small sharp teeth, or sub-entire; both surfaces glabrous, the upper dark-brown and shining, the lower paler and tinged olivaceous; main-nerves 4 or 5 pairs, curved, ascending, thin but distinct on the lower surface, faint on the upper; length 2·25 to 3·25 in.; breadth ·85 to 1·4 in.; petiole ·2 to ·3 in. *Heads* ·35 in. across, sessile, in small pedunculate axillary cymes, 3 in. long, diminishing upwards to ·75 in. in length; the peduncles and their branches everywhere pubescent, sometimes a small cyme with 2 to 4 heads in the same axil as a longer one. *Involucral bracts* of the outer two series short, ovate-lanceolate, blunt, densely pubescent, those of the inner two twice as long

(or more), linear-lanceolate, acuminate, puberulous or almost glabrous, 1-nerved, longer than the copious white pappus; corolla-lobes hairy; receptacle and *cypselas* silky, white. Hook. fil. Fl. Br. Ind. III. 268. *Conyza chinensis*, Linn. Sp. Pl. 862; Blume Bijdr. 898. *B. longispina*, Zoll. et Morr. Syst. Verz. 121. *C. serici-vestita*, Wall. Cat. 2996B. *Baccharis nitida*, Wall. Cat. 3043.

PENANG: *Curtis* 2824; *Wallich* 2996, 3043. SINGAPORE: *Ridley* 2744. PERAK: *Scortechini* 1471.

VAR. *riparia*, King & Gamble. Young leaves and stems somewhat hairy; main-nerves of leaves 3 to 4 pairs, depressed on the upper surface. *Blumea riparia*, DC. Prod. V. 444; Clarke Comp. Ind. 85. *Conyza riparia*, Blume Bijdr. 899

PERAK: *King's Collector* 1214; *Scortechini*.—DISTRIB. Java, Borneo.

2. BLUMEA BALSAMIFERA, DC. Prod. V. 466. A shrub, 6 to 12 feet high; young branches nearly as thick as a goose-quill, tomentose, striate. *Leaves* thickly membranous or sub-coriaceous, elliptic-lanceolate, coarsely and unequally serrate dentate or sub-entire, acute or sub-acute, narrowed at the base; upper surface dark olivaceous-green, minutely tomentose or strigose, the lower surface with dense silky cinereous-yellowish tomentum; main-nerves 7 to 10 pairs, curved, ascending, faint on both surfaces, but especially on the lower; length 2 to 3 in.; breadth ·75 to 1·5 in.; petioles ·2 to ·75 in. long, the longer ones often with lateral auricles; in the lower part of the branches the leaves often much larger. *Heads* sub-cylindric, sessile, or on short pedicels, arranged in large, lax, and spreading or dense, often leafy, corymbose or panicled, axillary and terminal tawny-tomentose cymes. *Involucral bracts* linear, acuminate, densely tomentose; hermaphrodite florets very numerous in the centre, narrowly tubular; receptacle naked. *Cypselas* 10-ribbed, silky; pappus copious, red. Clarke Comp. Ind. 89; Kurz For. Fl. Burm. II. 82; Hook. fil. Fl. Br. Ind. III. 270; Prain Bengal Plants, 598. *Conyza balsamifera*, Linn. Sp. Pl. ed. II. 1208; Wall. Cat. 2998; Roxb. Fl. Ind. III. 427. *C. vestita*, Wall. Cat. 2998. *C. appendiculata* Blume Bijdr. 895 (*not of Lam.*).

MALACCA: *Griffith* (K.D.) 3143; *Hervey*. PENANG: *Walker* 160; *Scott*; *Curtis* 29. PERAK: *Scortechini*; *King's Collector* 6343; *Wray* 1741. SINGAPORE: *G. Thomson*; *Hullett* 372; *Ridley* 2742. JOHORE: *King*.—DISTRIB. British India, Malay Archipelago.

VAR. *angustifolia*, King & Gamble. Leaves narrowly oblong, acute at both ends, less than ·5 in. broad.

SINGAPORE: *Ridley* 2742.

3. BLUMEA GLOMERATA, DC. in Wight Contrib. 15. An erect

herb, about 18 to 24 in. high; stem at the base nearly as thick as a goose-quill, sparsely sub-glandular-pubescent, the hairs spreading. *Leaves* membranous, olivaceous, sparsely strigose on both surfaces, the hairs on the upper surface with bulbous bases; the lower sessile, lyrately lobed, the lobes dentate, the apex acute; the upper leaves much smaller, lanceolate, dentate. *Heads* from ·2 to ·25 in. in diam., in small sessile clusters of 2 or 3, all in the axils of small leaf-like bracts along the long slender branches, forming a pseudo-spike. *Involucral bracts* narrowly linear, pubescent, 1-nerved; receptacle glabrous. *Outer florets* with very slender corollas. *Cypselas* faintly 8–10-ribbed, glabrous; pappus in a single row, white, shining. DC. Prod. V. 443; Hook. fil. Fl. Br. Ind. III. 262. *B. fasciculata*, DC. l.c. 442; Clarke Comp. Ind. 81. *B. fistulosa*, Kurz in Journ. As. Soc. Beng. 1877, II. 187. *B. holosericea, racemosa, spinellosa, gracilis, purpurea*, and *leptoclada*, DC. l.c. 442, 443. *Conyza fistulosa*, Roxb. Fl. Ind. III. 429. *Conyza racemosa, sericea, glomerata, gracilis, purpurea* and *holosericea*, Wall. Cat. 3002, 3021, 3055, 3064, 3076, 3103.

PENANG: *Deschamps*.—DISTRIB. British India, Malay Archipelago, China.

4. **BLUMEA WIGHTIANA**, DC. in Wight Contrib. 14. An erect, little-branched herb, 1 to 3 feet high, covered everywhere with silky white, scanty or copious, soft, sub-adpressed hairs; stem terete, about as thick as a goose-quill at the base, striate, brown, and nearly glabrous (from the fall of the hairs) when old. *Leaves* diminishing in size from below upwards, thickly membranous, obovate-oblong or elliptic-obovate, the apex acute or sub-acute, gradually narrowed from about the middle to the short petiole; the edges with a few irregular coarse teeth, sometimes slightly lobed; both surfaces olivaceous-brown when dry, and clothed, but especially the lower, with adpressed, short white pubescence; main-nerves 4 or 5 pairs, curved, ascending, faint on both surfaces; length 1·25 to 3 in.; breadth ·5 to 1·25 in.; petioles from ·1 to ·25 in. long or even more, sometimes auricled about the middle. *Heads* paniculate, about ·3 or ·4 in. across, axillary, solitary or in pairs (reduced cymes), or 4 to 6 in very short rounded axillary cymes on peduncles of varying length, but always short, the upper few inches of the stem crowded by a dense mass of cymes. *Involucral bracts* in several rows, diminishing in size outwards, the inner linear, somewhat longer than the pappus, all pubescent and 1-nerved; receptacle naked. *Outer florets* very numerous, their corollas very slender. *Inner florets* about 4, much wider than the outer. *Cypselas* small, puberulous; pappus in a single row, white. DC. Prod. V. 435; Clarke Comp. Ind. 74; Kurz in Journ. As. Soc. 1877, II. 156 (excl. syn. *hymeno-*

phylla); Hook. fil. Fl. Br. Ind. III. 261. *B. trichophora*, *parvifolia*, and *phyllostachya*, DC. l.c. 436, 437, 438. *Conyza lactucæfolia*, *paniculata*, *bifoliata*, and *Wightiana*, Wall. Cat. 3088 (*in part*), 3090A, 3091, 3093. *Erigeron molle*, Don Prod. 172.

PENANG and SINGAPORE: By roadsides, not common.—DISTRIB. British India and Ceylon, Malay Archipelago, tropical Australia and Africa.

5. BLUMEA LACERA, DC. in Wight Contrib. 14. An erect herb, 2 to 3 feet high; stems at the base nearly as thick as a goose-quill, adpressed-pubescent. *Leaves* thickly membranous, oblanceolate obtuse or sub-acute, much narrowed to the petiole, the edges unequally and remotely dentate; both surfaces olivaceous when dry, the lower somewhat the paler and with thin, pale pubescence; the upper glabrous, sub-scabrid; length 1·5 to 2 in.; breadth ·5 to 1 in.; petiole ·3 to ·5 in. long. *Heads* ·3 in. across, sub-sessile or sessile, in small rounded crowded cymes, on slender ebracteate axillary peduncles, 1 to 2·5 in. long, subtended by small leaf-like bracts, and occupying the upper half of the stem. *Involucral bracts* linear-oblong, tomentose, about as long as the pappus; receptacle naked. *Heads* ·4 in. across, sessile or nearly so, in a lax, shortly-branched, leafy, cymose, pubescent panicle, 12 to 18 in. long. *Involucral bracts* nearly uniform, linear, acuminate, 1-nerved, puberulous, as long as the pappus. *Receptacle* slightly convex, naked. *Cypselas* narrowly oblong, glabrous, not ribbed; pappus in a single row, white. DC. Prod. V. 436; Clarke Comp. Ind. 76; Hook. fil. Fl. Br. Ind. III. 263. *B. Musra*, DC. l.c. 435; Deless. Ic. Sel. IV. t. 23. *B. villosa*, Schultz-Bip. in Pl. Hohenack. n. 2*a*. *Conyza lacera*, Roxb. Fl. Ind. III. 428; Wall. Cat. 3082. *C. thyrsiflora*, *villosa*, and *Musra*, Ham.; Wall. Cat. sub 3082, 3083, 3095. *C. lactucifolia*, DC. l.c. 435; Wall. Cat. 3088 (*in part*); Burm. Fl. Ind. 180, t. 59, f. 1.

PERAK: *Scortechini* 141, 1430. SINGAPORE: *Cantley*; *Hullett* 227. —DISTRIB. British India, Ceylon, Malay Archipelago, China, tropical Africa.

6. BLUMEA MEMBRANACEA, DC. Prod. V. 440. A rigid erect herb, 1 to 2 feet high; stem at the base half as thick as a goose-quill, minutely pubescent from base to apex, terete, striate. *Leaves* thinly membranous, oblanceolate, much tapered to the base, sub-sessile, the apex acute, the edges coarsely and often irregularly dentate, sometimes lobulate; both surfaces pale olivaceous-brown when dry, the lower paler, sparsely strigose; main-nerves 7 to 9 pairs, spreading, faint on both surfaces; length 2 to 3·5 in.; breadth ·8 to 1·5 in.; the leaves of the upper part of the stem smaller and bract-like. *Heads* ·25 in. in diam., sessile or sub-sessile, in spikes several inches long, from the

axils of small leaf-like bracts, arranged in a narrow pseudo-panicle occupying the upper half of the stem. *Involucral bracts* linear, acuminate, pubescent, 1-nerved, as long as the inner pappus. *Corollas* very narrow; receptacle naked. *Cypselas* small, glabrous; pappus white, in two rows, the outer very short. Hook. fil. Fl. Br. Ind. III. 265. *B. hymenophylla*, DC. l.c. 440. *Conyza membranacea* and *hymenophylla*, Wall. Cat. 3019, 3038. *C. virens*, Wall. Cat. 3037D. *C. diffusa*, Roxb. Fl. Ind. III. 429.

PENANG: *Curtis* 2759; *Deschamps*.—DISTRIB. British India, Malay Archipelago.

9. LAGGERA, Schultz.-Bip.

Annual or perennial herbs. *Leaves* alternate, often rigid and decurrent. *Heads* panicled or axillary, heterogamous, disciform. *Outer flowers* ♀, in several rows, fertile, filiform, the mouth minutely toothed. *Disk-flowers* ⚥, in several rows, fertile, tubular, 5-fid. *Involucre* campanulate; bracts many-rowed, narrow, often rigid, the outer shorter; receptacle flat, naked. *Anthers* 2-lobed or sagittate at the base; the auricles obtuse or acute, often unequal, not tailed or connate with the adjoining anthers. *Style-arms* of the hermaphrodite flowers and the pappus as in *Blumea*.—DISTRIB. 9 or 10 species, in tropical Africa and British India.

LAGGERA FLAVA, Benth. in Gen. Pl. II. 290. A glabrous or puberulous herb, 6 to 30 in. high; stems striate, simple or corymbosely branched. *Leaves* membranous, shining, glabrous; the radical sometimes on short petioles; the cauline sessile; the lower cauline oblong, acute, cordate and sub-amplexicaul at the base; the upper cauline smaller and narrower than the lower, lanceolate; all sharply and unequally toothed; main-nerves about 8 pairs, distinct, like the wide reticulations. *Heads* few, ·25 in. in diam., on slender peduncles; receptacle glabrous; corollas yellow; anthers sagittate. *Cypselas* minute, glabrous. Clarke Comp. Ind. 90; Hook. fil. Fl. Br. Ind. III. 270. *Blumea flava*, DC. Prod. V. 439. *Erigeron falcatum*, Don Prod. 172; Kurz in Journ. As. Soc. Beng., 1877, II. 191 (*excl. syn.*). *Conyza fasciculata*, Wall. Cat. 3017.

PENANG: *Wallich*.—DISTRIB. British India.

This has not been collected within our area since Wallich's time.

10. PLUCHEA, Cass.

Shrubs or herbs, tomentose or glutinous. *Leaves* alternate, dentate or rarely entire, sometimes pinnatifid. *Heads* usually small, in terminal corymbose cymes, or large and sub-solitary, heterogamous, disciform, white yellow, or lilac. *Outer florets* ♀, in several series, fertile, filiform. *Disk-florets* ☿, few, sterile, tubular and 5-fid. *Involucre* broadly ovoid or campanulate; its bracts few or in many rows, imbricate, ovate or lanceolate, dry, rigid; receptacle flat, naked. *Corollas* of the ♀ flowers filiform, shorter than their own styles, their apices with 3 teeth; *corollas* of the ☿ flowers regular, tubular, the limb slightly widened, 5-cleft. *Anthers* sagittate at the base, their basal auricles tailed. *Style-arms* of the ☿ flowers filiform, entire or bifid. *Cypselas* small, 4- or 5-angled. Hairs of *pappus* slender, rigid, in a single series, free, or (in the sterile cypselas) connate in groups.—DISTRIB. About 30 species, tropical and sub-tropical.

PLUCHEA INDICA, Less.; DC. Prod. V. 451. A low shrub, glabrous or nearly so; stems smooth, terete. *Leaves* membranous, obovate or oblanceolate, the apex obtuse or acute, acuminate or apiculate, narrowed to the base; edges dentate, serrate or sub-serrate; both surfaces olivaceous-brown when dry, glandular; main-nerves 3 to 6 pairs, curving upwards, bold beneath; length ·5 to 2·75 in.; breadth ·3 to 1·25 in.; petioles ·1 in. to ·4 in. long. *Heads* ·25 in. in diam., in compound terminal puberulous corymbose cymes, much longer than the leaves; involucral bracts few, rather broad, obtuse. *Florets* of the disk 3; those of the ray numerous. *Cypselas* minute, ribbed, nearly glabrous; pappus scanty, spreading, reddish-white. Wight Ill. t. 131; Clarke Comp. Ind. 93; Hook. fil. Fl. Br. Ind. III. 272; Prain Bengal Plants 600. *P. foliosa*, DC. l.c. 451. *Conyza corymbosa*, Roxb. Fl. Ind. III. 426; Wall. Cat. 3009. *C. indica*, Miq. Fl. Ind. Bat. II. 58. *Baccharis indica*, Linn.

MALACCA: *Griffith*. PENANG: *Wallich*. SINGAPORE: *Kurz*. DINDINGS: *Curtis* 3451. PERAK: *Scortechini* 848; *King's Collector* 2893. —DISTRIB. British India, Malay Archipelago, China, Australia

11. SPHÆRANTHUS, Linn.

Annual herbs with spreading branches. *Leaves* alternate, toothed, decurrent. *Flower-heads* proper, small, heterogamous, disciform, sessile, on a common receptacle, bracteate or not, and forming solitary, globose, or ovoid, a head-like terminal cluster, usually bearing at its base an involucre of a few empty bracts. *Outer florets* ♀, few or many, fertile, slender; *inner* solitary or few, ☿, fertile or sterile; involucre narrow, its bracts dry, narrow, unequal, acute; receptacle small, naked; pappus none. *Florets:* ♀ with filiform, minutely 2–3-toothed corollas; ☿ with regular corollas with thickened tube and 4–5-toothed limb. *Anthers* with sagittate bases acute or tailed. *Style* of ☿ florets with filiform arms or entire. *Cypselas* oblong, sub-compressed, without pappus.—DISTRIB. About 8 species, tropics of Asia, Africa, and Australia.

SPHÆRANTHUS AFRICANUS, Linn. Sp. Pl. 1314. Annual, glabrous or pubescent, the stem and branches with long decurrent, entire wings. *Leaves* membranous, oblanceolate, acute or sub-acute, with a small bristle-point at the apex, the base narrowed and confluent with the wing of the branch, the edges bristle-serrate; length 1 to 3 in.; breadth ·25 to 1·25 in. *Clusters of heads* globose, ·3 to ·4 in. in diam., pedunculate, their involucres few, scarious, rounded or jagged, not imbricate; the peduncles ·25 to ·4 in. long, glabrous, with a wing widening at the base. *Female florets* about 15, gibbous. Hook. fil. Fl. Br. Ind. III. 275; Prain Bengal Plants, 601. *S. africanus* and *S. microcephalus*, Willd. Sp. Pl. III. 2395. *S. microcephalus*, DC. Prod. V. 360; Clarke Comp. Ind. 97. *S. indicus*, Willd. l.c. 2394; Roxb. Hort. Beng. 62, Fl. Ind. III. 446. *S. africanus*, Wall. Cat. 3179 (*in part*).

MALACCA: *Griffith.* KEDAH: *King's Collector* 1701. SINGAPORE: *Ridley* 5069. PENANG: *Curtis* 1942; *Deschamps.* PROVINCE WELLESLEY: *Ridley* 7125. PERAK: *Scortechini* 1640.—DISTRIB. British India, Malay Archipelago, China, Philippines, Australia, Africa.

12. EMILIA, Cass.

Annual or perennial herbs, glabrous or hairy, often glaucous, sometimes sarmentose. *Leaves* alternate, radical, crowded, petiolate, entire, toothed or lyrate-pinnatifid; cauline few, stem-clasping. *Heads* on long peduncles, solitary or loosely corymbose, ebracteolate at the base, homogamous, discoid, yellow or red; florets all ⚥, fertile, tubular, the limb elongate and 5-toothed. *Involucre* cylindric; its bracts in a single series, equal, free or cohering, striate; *receptacle* flat, naked. *Style-arms* sub-terete, their apices short and obtuse, or long and acute. *Cypselas* sub-terete, or 5-ribbed or -angled; pappus hairs numerous, white, silky.—DISTRIB. Species 14 or 15; all Indo-Malayan and tropical African.

EMILIA SONCHIFOLIA, DC. Prod. VI. 302. Annual, usually erect, sometimes diffuse and sarmentose, 12 to 30 in. high. *Leaves*: the lower lyrate-pinnatifid or sinuate-dentate, rarely elliptic, glabrous or puberulous, sometimes scaberulous, 1·5 to 4 in. long; petioles variable but rarely exceeding an inch in length; cauline leaves much smaller, hastate or linear-hastate, dentate, sessile and auriculate, more or less stem-clasping. *Heads* ·4 in. long and the same in diam. when expanded, on long ebracteate or scantily bracteate peduncles, collected in lax terminal long pedunculate spreading corymbs. *Involucre* nearly as long as the purple florets, ecalyculate; its bracts linear-oblong, sub-acute. *Cypselas* truncate at each end, minutely hairy. DC. in Wight Contrib. 24. *E. sonchifolia, vars.* α and β, Clarke Comp. Ind. 174. *Calcalia sonchifolia*, Linn. Sp. Pl. 835; Roxb. Fl. Ind. III. 413; Don Prod. 180; Wall. Cat. 3144. *E. glabra*, Heyne in Wall. Cat. 3145. *Gynura ecalyculata*, DC. l.c. 298. *Prenanthes sarmentosa*, Wall. Cat. 3262E. *E. scabra*, DC. l.c. 303; Wight Ic. 1123. *E. mucronata*, Clarke Comp. Ind. 175.

SINGAPORE: *Hullett* 240. PENANG: *Deschamps*; *Scortechini*; *Stolickza*.—DISTRIB. British India, Malay Archipelago, China.

VAR. *minor*, King & Gamble. Little more than a foot high, lower leaves broadly ovate, truncate at the base, on long narrow winged petioles.

PERAK: *King's Collector* 301. PENANG: in Klang and Batu Gaja jungles: *Deschamps*.

In this variety the terminal lobe only of the leaf is developed, the lower part being long and narrow like a petiole.

13. GYNURA, Cass.

Succulent herbs, rarely undershrubs, sometimes climbers, glabrous or hispid. *Leaves* alternate, entire, toothed or pinnatisect. *Heads* solitary or in corymbs, bracteolate at the base, homogamous, disciform, yellow or purplish. *Florets* yellow: all the ⚥ tubular, fertile (rarely a few of the outer ones more slender and ♀) the limb 5-toothed. *Involucre* cylindric or sub-campanulate; the bracts 10 or 12, in a single series, narrow, equal; their margins scarious; receptacle flat, pitted or shortly fimbrillate. *Anthers* with bases entire or sub-auricled. *Style-arms* slender; their apices long, slender, subulate, hispid. *Cypselas* narrow, many-ribbed; hairs of pappus copious, in many series, slender, white.—DISTRIB. Species about 20, Asia, Africa, and Australia.

Scandent; leaves subentire or slightly dentate, petiolate .. 1. *G. sarmentosa*.
An erect herb; leaves always boldly dentate and often pinnatisect or pinnatifid, sessile and often sub-amplexicaul or auriculate .. 2. *G. bicolor*.

1. GYNURA SARMENTOSA, DC. Prod. VI. 298. Stem and branches loosely twining, glabrous except the puberulous peduncles, thinner than a goose-quill, pale brown and striate when dry. *Leaves* succulent, elliptic to elliptic-lanceolate, acute or acuminate, the base cuneate, the edges subentire or slightly dentate, both surfaces brown when dry, glabrous; main-nerves 4 or 5 pairs, spreading, faint on both surfaces; length 1 to 3 in.; breadth ·4 to 1 in.; petioles of the lower leaves ·15 to ·4 in.; the small upper leaves often sessile. *Heads* few, ·65 to ·75 in. long, and as much in diam., on slender puberulous

pedicels usually in scanty, lax, long-peduncled, axillary and terminal cymes longer than the leaves; bracteoles of the panicle and of the calyculus at the base of the involucre few, small, linear. *Involucre* spreading little, its bracts narrowly oblong, subacute or blunt, glabrous; their edges scarious, nearly as long as the florets. *Cypselas* small, brown, with 10 puberulous ribs; pappus white. Hook. fil. Fl. Br. Ind. III. 335. *G. Finlaysoniana*, DC. l.c. 299; Deless. Ic. Sel. IV. t. 55. *Cacalia cylindrifolia*, *reclinata*, and *Finlaysoniana*, Wall. Cat. 3150, 3151, 3162. *Sonchus volubilis*, Rumph. Herb. Amb. V. t. 103 f. 2.

In all the provinces, common.—DISTRIB. Malayan Archipelago; Siam; Philippines.

2. GYNURA BICOLOR, DC. Prod. VI. 299. Herbaceous, 2 or 3 feet high, glabrous or sparsely and minutely glandular-hairy on the upper part; stems erect, branched, about the thickness of a quill near the base, boldly striate when dry. *Leaves* pinnatisect or pinnatifid, the lobules acutely dentate; the terminal lobe narrow and acuminate, narrowed at the base into a petiole varying in length from ·5 to 1 in.; the upper sessile and often auriculate at the base, or shorter and narrowly obtuse with large teeth; length 2·5 to 5 in.; breadth ·4 to 3 in. *Heads* about ·5 in. long, less in diam. Involucral bracts narrow, with scarious margins and acute often recurved tips. *Cypselas* very slender, much ribbed, sub-glabrous; pappus copious, white, tinged with pink. Hook. fil. Fl. Br. Ind. III. 335. *Cacalia bicolor*, Roxb. Fl. Ind. III. 412;, Salisb. Hort. Parad. t. 25; Bot. Regist. t. 110.

SINGAPORE: *Ridley* 1618. JOHORE: *Ridley* 2741; *King*. PERAK: *Wray* 1445, 3599. PENANG: *Deschamps*. MALACCA: *Griffith* (K.D.), 3235.—DISTRIB. China, Moluccas.

14. SIEGESBECKIA, Linn.

Glandular-pubescent herbs. *Leaves* opposite, toothed. *Heads* in leafy panicles, heterogamous, sub-radiate, yellow or white. *Ray-florets* ♀, in a single series, fertile, the corollas short-tubed, with 2–3-fid limb or a short, broad ligule. *Disk-florets* ⚥, fertile, or the inner ones sterile; the corollas regular, tubular, the limb campanulate and 5-fid or narrow and 3- to 4-toothed. *Involucre* campanulate or hemispheric, the bracts few, herbaceous, glandular, the outer usually 5, spathulate, spreading; the inner enclosing the ray-florets. *Receptacle* small; the pales membranous, concave. *Anthers* with entire bases. *Style of ⚥ florets* with short, flattened, sub-acute arms. *Cypselas* obovoid-oblong, often incurved, their apices obtuse;

pappus none.—DISTRIB. Six species, one cosmopolitan, tropical and sub-tropical, the others South American and African.

SIEGESBECKIA ORIENTALIS, Linn. Sp. Pl. 900. An erect annual, 1 to 3 feet high, branching, the lower branches opposite, everywhere clothed with pubescence, often glandular and crisped. *Leaves* membranous, opposite, the lower ovate sub-rhomboid, the upper ovate-lanceolate, dentate or crenate, passing into linear-lanceolate, and sometimes entire; all cuneate at the base; both surfaces olivaceous when dry; the upper scabrid, hispid; the lower more softly hairy; main-nerves 3 or 4 pairs, curved, spreading; length 1 to 4 in.; petioles very short or absent. *Involucre* with the outer bracts longer than the inner. *Cypselas* black, the outer enclosed in the glandular involucral bracts. Boiss. Fl. Orient. III. 250; DC. Prod. V. 495; Wight Ic. 1103; Wall. Cat. 3182; Hook. fil. Fl. Br. Ind. III. 304; Prain Bengal Plants, 607. *S. glutinosa*, Wall. Cat. 3182. *S. brachiata* and *S. orientalis*, Roxb. Fl. Ind. III. 432. *Minyranthes heterophylla*, Turcz. in Bull. Soc. Imp. Nat. Misc. 1851, I. 181.

In all the provinces, near habitations.

15. ECLIPTA, Linn.

Strigose or hirsute annuals. *Leaves* opposite. *Heads* small, axillary or terminal, pedunculate, heterogamous, rayed. *Ray-florets* ♀, sub-2-seriate, fertile or sterile, ligulate, small, entire or bifid, white rarely yellow. *Disk-florets* ⚥, fertile, tubular, 4–5-fid. *Involucre* hemispheric or broadly campanulate; its bracts sub-2-seriate, herbaceous, the outer large and broad; receptacle flat or nearly so, the outer pales enclosing several florets; the inner ones narrow, sometimes absent. *Anthers* with obtuse, almost entire, bases. *Style-arms* flattened, with short triangular or obtuse appendages. *Cypselas* of the ray narrow, triquetrous, sometimes barren; those of the disk stouter, somewhat compressed laterally, the apex entire, toothed or 2-aristate.—DISTRIB. 7 species in South America and Australia, and 1 cosmopolitan in the tropics.

ECLIPTA ERECTA, Linn. Mant. II. 266. An erect or diffuse branched slender herb, hirsute or strigillose. *Leaves* variable in form and size, sessile or with very short petioles; linear, oblong-lanceolate or narrowly elliptic; narrowed at both ends; main-nerves 3 or 4 pairs, spreading, faint; length 1 to 4 in.; breadth ·2 to ·5 in. *Heads* ·3 to ·4 in. in diam., solitary or in pairs from the leaf-axils; the peduncles ·25 to 1·5 in. long, when in pairs always unequal. *Involucral bracts* equal to or longer than the flowers, unequal, ovate or obovate, apiculate. *Cypselas* scabrid, without pappus. Clarke Comp. Ind. 134; Hook.

fil. Fl. Br. Ind. III. 304; Prain Bengal Plants; 610. Lam. Ill. t. 687. *E. alba*, Hassk. Pl. Jav. Rar. 528; Clarke Comp. Ind. 134; Hook. fil. Fl. Br. Ind. III. 304. *E. marginata*, Boiss. Fl. Orient. III. 249. *E. prostrata*, Linn. Mant. II. 266; Roxb. Fl. Ind. III. 438. *E. prostrata, undulata*, and *parviflora*, Wall. Cat. 3209, 3210, 3213. *Verbesina alba* and *prostrata*, Linn. Sp. Pl. 902.

In all the provinces. In and near cultivated ground.—DISTRIB. The tropics generally.

16. WEDELIA, Jacq.

Hirsute or scabrid-pubescent herbs or undershrubs, sometimes scandent. *Leaves* opposite. *Heads* axillary or terminal, heterogamous, rayed. *Ray-florets* ♀, fertile, ligulate, spreading, entire, or 2-toothed at the apex. *Disk-florets* ⚥, fertile or the inner sterile; the corolla tubular, regular, with elongate 5-toothed limb. *Involucre* campanulate or sub-hemispheric; its bracts sub-2-seriate, the outer 3 to 5 usually herbaceous, the inner dry; receptacle flat or convex, the pales enclosing the flowers. *Anthers* entire or sub-sagittate at the base. *Style* of ⚥ florets with acute arms hirsute at their tips. *Cypselas* cuneate-oblong or obovoid, thick, smooth or tubercled, laterally compressed or the outer triquetrous, tip rounded, margins obtuse or thickened; pappus none, or reduced to a toothed cup or ring, or sometimes of short scales with occasionally a few bristles.—DISTRIB. Species about 70, tropical and sub-tropical.

WEDELIA BIFLORA, DC. in Wight Contrib. Fl. Ind. 18. Scandent; stem and branches hispid-puberulous when very young, afterwards almost glabrous, obtusely 4-angled, grooved when dry. *Leaves* membranous, broadly ovate or ovate-subrhomboid to lanceolate, apex acuminate, edges coarsely serrate except at the broad, slightly cuneate base; both surfaces dull olivaceous green when dry, minutely reticulate, sparsely hispid-puberulous; main-nerves one large pair ascending from the base of the midrib to near the apex branching outwards and one or two smaller pairs from above the middle of the midrib, all distinct on both surfaces; length 2 to 4·5 in.; breadth 1·25 to 2·75 in.; petioles ·75 to 1·5 in., those of the branches smaller. *Heads* about ·5 in. in diam., solitary on a short peduncle ·75 in. or less in length, or 2 to 4 on peduncles two or three times as long. *Involucral* bracts in two rows, oblong or ovate-lanceolate, apiculate, concave, scabrid-puberulous outside like the peduncles, often recurved. Ripe *cypselas* triquetrous, scaberulous, the apex with some hairs and several short bristles, one longer than the others. Hook. fil. Fl. Br. Ind. III. 306. *W. scandens*, Benth.; Prain Bengal Plants, 612; Clarke Comp. Ind. 136 (*excl. syn.*). *Woolastonia* *biflora* and *W. scabriuscula*, DC. Prod. V. 546, 547. *W. biflora*, Wight Ic. 1108. *Verbesina biflora*, Linn. Sp. Pl. Ed. II. 1272. Wall. Cat. 3207 (*in part*). *V. dichotoma*, Wall. Cat. 3024 (*in part*). *Eclipta scabriuscula*, Wall. Cat. 3212 (partly). *Acmella biflora*, Spreng. Syst. III. 591.

On the sea coast, common.

17. SPILANTHES, Linn.

Annual herbs. *Leaves* opposite. *Heads* axillary or terminal, usually on long peduncles, heterogamous and rayed, or homogamous and disciform. *Ray-florets* ♀, in a single series, fertile, ligulate, white or yellow. *Disk-florets* ⚥, fertile, tubular, with 4- or 5-fid limb. *Involucre* ovoid or campanulate, the bracts sub-2-seriate; receptacle convex, elongate, the pales enclosing the flowers often connate with the ovary into a stalk. *Anthers* with truncate entire or bifid bases. *Style-arms* of ⚥ florets truncate. *Cypselas* of ray-florets triquetrous or dorsally compressed, the margins and angles usually ciliate; pappus none or of 2 or 3 bristles.—DISTRIB. About 40 species, chiefly tropical American.

SPILANTHES ACMELLA, Murr. Syst. ed. XIII. 610. Erect or ascending, glabrous, branched, 1 to 2 feet long; the branches as thick as a crow-quill, striate, glabrous, pale brown when dry. *Leaves* membranous, ovate-lanceolate or elliptic, with sub-acute apex and cuneate base, the edges crenate serrate or entire; main-nerves a single pair, ascending; length ·75 to 1·5 in.; petioles ·1 to ·3 in. long. *Heads* ovoid-conical, ·35 to ·5 in. long, on slender peduncles 1 to 2·5 in long, solitary or in very lax panicles. *Involucral bracts* short, oblong, blunt or sub-acute, 3-nerved. *Ray-florets* minute. *Cypselas* sometimes marginate, scabrid or smooth; pappus of one or two bristles or absent. DC. Prod. V. 623; Prain Bengal Plants, 614; Wall. Cat. 3285; Clarke Comp. Ind. 138; Hook. fil. Fl. Br. Ind. III. 307. *S. calva*, DC. l.c. V. 625; Wight Ic. 1109. *S. pseudo-Acmella*, Linn.; DC. l.c. 625, and in Wight Contrib. 19; Wall. Cat. 3185. *S. oleracea*, Jacq. Hort. Vind. II. t. 135; Roxb. Fl. Ind. III. 410; DC. l.c. 624. *Bidens fervida* and *B. fixa*, Lamk. Dict. I. 415, 416. *Cotula conica*, Wall. Cat. 3185. *Verbesina Acmella*, Linn. Sp. Pl. 901. *V. pseudo-Acmella*, Linn. l.c. 901.

MALACCA: *Griffith* (K.D.) 3186; *Cuming* 2361. PERAK: *Scortechini* 1400. PENANG: *Deschamps.*

18. SYNEDRELLA, Gaertn.

Annual branched herbs. *Leaves* opposite, petiolate, dentate. *Heads* small, axillary and terminal, heterogamous, rayed. *Involucre* ovoid or oblong, its bracts few; the outer one or two foliaceous, passing into the flat scarious pales of the small receptacle. *Ray-florets* few, ♀, ligulate, with short broad 2–3-toothed lamina. *Disk-florets* ⚥, tubular, regular, the limb 4-toothed. *Anthers* syngenesious, their bases sub-entire. *Style-arms* of ⚥ florets long, acute. *Cypselas* of ray-florets much compressed dorsally, smooth, their edges winged and with long teeth; those of the ⚥ few, narrower, compressed or trigonous often muricate; pappus in both consisting of 2 (rarely more) bristles.—DISTRIB. Species 2, tropical American, 1 also Asiatic and African.

SYNEDRELLA NODIFLORA, Gaertn. Fruct. II. 456, t. 171, f. 7. An erect dichotomous annual with terete wiry glabrous branches thicker than a crow-quill; all parts more or less scaberulous. *Leaves* membranous, opposite, petiolate, ovate, acute, the base cuneate, the edges serrate or crenate (sometimes obscurely so); main-nerves 3 or 4 pairs, the lower pair long and bold, the others short and faint; both surfaces minutely and sparsely strigose, and greenish when dry; length ·75 to 3 in.; breadth ·3 to 1·25 in.; petioles ·1 to ·4 in. often ciliate on the edges. *Heads* ·25 in. in diam., axillary, solitary or in small clusters, usually sessile but sometimes on short peduncles; inner bracts of the involucre linear-lanceolate, shining. *Cypselas* of the inner flowers muricate, with 2 unequal hispid pappus hairs longer than themselves and than the corolla; outer cypselas shorter, broader, smooth, black; their edges winged, deeply toothed, pale. Hook. Exot. Flora, t. 60; Clarke Comp. Ind. 139; Hook. fil. Fl. Br. Ind. III. 308; Prain Bengal Plants, 615. *Verbesina nodiflora*, Linn. Amoen. Acad. IV. 290.

Near cultivation, common.

19. BIDENS, Linn.

Herbaceous, annual or perennial, sometimes scandent. *Leaves* opposite, entire, irregularly lobed or 1–2-pinnatisect. *Heads* small and corymbose or larger and sub-solitary, heterogamous and rayed. *Ray-florets* in one series, neuter or rarely ♀, fertile, the corolla ligulate, yellow or white, spreading, entire or somewhat toothed. *Disk-florets* ⚥, fertile, tube, cylindric, limb shortly 5-fid; occasionally homogamous from the abortion of the ray-florets. *Involucre* campanulate or sub-hemispheric, its bracts in two series, often slightly connate below; the outer short herbaceous or long and leafy, the inner membranous; receptacle flat or convex; its pales narrow, little concave. *Anthers* entire or bluntly sagittate at the base. *Style* of ⚥ florets with arms hirsute upwards and short acute or long apices. *Cypselas* dorsally compressed or somewhat tetragonous, linear or cuneiform, often narrowed but not beaked above; pappus of 2 to 4 persistent, retrorsely barbellate arms.—DISTRIB. About 120 species, chiefly American.

BIDENS PILOSA, Linn. Sp. Pl. 832. An erect, very variable, glabrous pubescent or pilose herb, 6 to 24 in. high; stems when dry 4-angled. *Leaves* 3-fid to 3-partite, or 2–3-pinnatifid, their segments broadly or narrowly ovate to lanceolate, serrate. *Heads* ·3 to ·4 in. across, on long stout petioles of varying length, terminal or axillary. *Ray-flowers* when present white or yellow, often absent. *Involucral bracts* shorter than the flowers, broadly oblong, with scarious margins. *Cypselas* black, compressed, long, narrow, slender, ribbed; pappus of 3 or 4 bristles shorter than the cypselas, pale brown.

VAR. 1 *pilosa* proper, Hook. fil. Fl. Br. Ind. III. 309; leaves 3-fid or 3-sect, their segments broadly or narrowly ovate or lanceolate, serrate. *B. pilosa*, Linn.; DC. Prod. V. 597; Clarke Comp. Ind. 140; Prain Bengal Plants, 616. *B. leucantha*, Willd. *B. chinensis*, Willd.; Wall. Cat. 3189 (*in part*). *B. tripartita* and *B. bipinnata*, Wall. Cat. 3187 (*in part*).

VAR. 2 *bipinnata*, Hook. fil. l.c. 309; leaves bipinnately compound, their segments ovate lanceolate or linear, entire lobed or toothed. *B. bipinnata*, Linn.; Roxb. Fl. Ind. III. 411. *B. chinensis*, Wall. Cat. 3189 (*in part*). *B. Wallichii*, DC. Prod. V. 598.

VAR. 3 *decomposita*, Hook. fil. l.c. 310; leaves decompoundly pinnatifid, segments linear, slender. *B. decomposita*, Wall. in DC. Prod. V. 602, Cat. 3188; Clarke Comp. Ind. 141 *excl. var. β*.

In all the provinces: in waste ground near cultivation, but not common.—DISTRIB. In all warm countries.

20. TRIDAX, Linn.

A perennial herb. *Leaves* opposite, pinnatisect, with few narrow segments. *Heads* solitary on very long peduncles, heterogamous, rayed. *Ray-florets* ♀, fertile, ligulate or bilabiate, the outer lip large 3-fid, the inner small and 2-fid or none. *Disk-florets* ⚥, fertile, tubular, the limb elongate and 5-fid. *Involucral bracts* in few series, the outer short broad herbaceous; receptacle flat or convex; its scales membranous. *Anthers* with short acute auricles at their bases. *Style-arms* of the ⚥ flowers hairy above, their apices subulate. *Cypselas* oblong or depressed-globose, silky; pappus of unequal aristate feathery bristles. —DISTRIB. 7 species, tropical American, 1 being an introduced weed in the tropics of Asia.

TRIDAX PROCUMBENS, Linn. Sp. Pl. 900. Procumbent, hirsute, with slightly branched stems as thick as a crow-quill. *Leaves* membranous, few, ovate-lanceolate, deeply and irregularly serrate, ·5 to 2 in. long.

Heads ·4 to ·6 in. in diam., on slender erect solitary peduncles 3 to 8 in. long. *Cypselas* brown; pappus shining, white. DC. Prod. V. 679; Wall. Cat. 3197; Clarke Comp. Ind. 142; Hook. fil. Fl. Br. Ind. III. 311; Prain Bengal Plants, 618.

In cultivated and waste places: an introduction.

21. CENTIPEDA, Lour.

Annual or perennial herbs. *Leaves* alternate, entire or toothed. *Heads* small, axillary, sessile or racemose, heterogamous, disciform, yellow. *Outer florets* ♀, in many rows, fertile, their corollas minute, obscurely lobed. *Disk-florets* ⚥, few, fertile, their corollas with short tube and campanulate 4-fid limb. *Involucre* hemispheric, its bracts in 2 series, spreading in fruit; receptacle naked. *Anthers* obtuse and entire at the base. *Style-arms* of ⚥ flower short, truncate. *Cypselas* 4-angled, the apices obtuse, the angles hairy; the hairs sometimes hooked; pappus none.—DISTRIB. 43 species, Asiatic, Australian, and South American.

CENTIPEDA ORBICULARIS, Lour. Fl. Cochinch. III. 493. An annual prostrate herb with numerous thin rooting stems, glabrous or sparsely tomentose. *Leaves* obovate-oblong or cuneate, ·2 to ·5 in. long, sparsely toothed. *Heads* ·1 to ·15 in. in diam., globose, solitary, axillary, sub-sessile. *Florets*, ♀ minute, numerous, tubular, minutely 3-toothed; ⚥ 10 to 12, 4-toothed. *Cypselas* with simple hairs. Hook. fil. Fl. Br. Ind. III. 317; Prain Bengal Plants, 620. *C. minuta*, Benth. in Bth. & Hook. fil. Gen. Pl. II. 230; Clarke Comp. Ind. 151. *Myriogyne minuta*, Less.; DC. Prod. VI. 139. *Cotula sternutatoria*, Wall. Cat. 3259. *C. minima*, Willd. Sp. Pl. III. 2170. *Dichrocephala Schmidii*, Wight Ic. 1610. *Artemisia sternutatoria*, Roxb. Fl. Ind. III. 423. *A. minima*, Linn. Sp. Pl. 849. *Sphæromorphæa centipeda*, DC. l.c. 140.

In all the provinces: by the sides of roads in cultivated ground, not common.

22. ARTEMISIA, Linn.

Herbs or shrubs, usually fragrant. *Leaves* alternate, 1- to 3-pinnatisect, serrate or entire. *Heads* small, numerous, racemose or panicled, solitary or in fascicles (never corymbose), heterogamous or homogamous, disciform. *Outer florets* ♀, in a single series, fertile, very slender, 2- to 3-toothed. *Disk-florets* ⚥, fertile or sterile, the limb 5-fid. *Involucre* ovoid, sub-globose or hemispheric; bracts in few series, the outer shorter, their margins scarious; receptacle flat or convex, naked or hairy. *Anthers* with entire obtuse bases. *Style-arms* of the ⚥ florets with truncate, usually penicillate, tips. *Cypselas* very minute, oblong, ellipsoid or sub-obovoid, faintly striate; pappus none.—Distrib. About 240 species in the north temperate regions mostly of the Old World.

Artemisia vulgaris, Linn. Sp. Pl. 848. A small shrub; stems as thick as a goose-quill, brown when dry, sub-glaucous and with sparse white pubescence. *Leaves* membranous, varying much in shape and size, those near the base several inches long, large pinnatipartite or bi-pinnatipartite, the pinnules oblong, the ultimate lobes entire with sub-aristate apices, leaves of the stem diminishing in size upwards, laciniate, and passing near the apex into simple linear bracts less than ·5 in. long; all glabrous on the upper surface and white adpressed-pubescent on the lower. *Heads* about ·15 in. long, cylindric or narrowly campanulate, sessile, solitary or in small clusters, in axillary sub-secund spikes of varying length, the upper part of the stem forming a long spike. *Involucral bracts* only 5 or 6, broadly lanceolate or oblanceolate, the inner scarious. *Corollas* glabrous. DC. Prod. V. 112; Boiss. Fl. Orient. III. 371; Roxb. Fl. Ind. III. 420; Clarke Comp. Ind. 161; Hook. fil. Fl. Br. Ind. III. 325. *A. indica*, Willd.; DC. l.c. 114; Roxb. Fl. Ind. III. 419; Wight Ic. 1112; Wall. Cat. 3293. *A. dubia*, Wall. Cat. 3307; DC. l.c. 110. *A. myriantha*, Wall. Cat. 3297; DC. l.c. 112. *A. paniculata*, Roxb. Fl. Ind. III. 418. *A. leptostachya*, DC. l.c. 113. *A. grata*, Wall. Cat. 3294 (*in part*); DC. l.c. 114. *A. lavandulæfolia*, DC. l.c. 110.

In all the provinces, near cultivation, not common and probably introduced.—Distrib. Europe, Northern Asia, India, mountains of the Malayan Archipelago.

23. Crepis, Linn.

Annual or perennial herbs, glabrous or hairy, hairs all simple. *Leaves* alternate, radical or cauline, the latter often stem-clasping, entire toothed or pinnatifid. *Heads* pedunculate, solitary, fasciculate or corymbose, yellow or red, homogamous, ligulate. *Involucre* cylindric or campanulate; bracts either multi-seriate and regularly imbricate, or the outer smaller and shorter than the single series of inner; base of midrib often thickened after flowering; receptacle flat, rarely concave, naked or shortly fimbrillate. *Corollas* ligulate, with broad 5-toothed apices. *Anthers* syngenesious, their bases sagittate, the auricles acute or shortly setaceous. *Cypselas* more or less fusiform or oblong, rarely short and cylindric, often slender, glabrous or scaberulous, 10- to 20-ribbed, the apex narrowed or beaked; pappus usually copious, short or long, the hairs simple, soft, usually silvery, rarely brownish and stiff or brittle.—Distrib. Species about 10, chiefly in the northern regions of the Old World.

CREPIS JAPONICA, Benth. Fl. Hongk., 194. Annual; glabrous or puberulous; stems one or more from the same root, 6 to 18 in. high. Radical *leaves* oblanceolate, runcinate-pinnatifid or sinuately toothed, 1 to 2·5 in. long, usually on petioles ·5 to 1·5 in. long; cauline *leaves* few, much smaller and often sessile. *Heads* ·2 in. long and ·3 in. in diam. when expanded, on short, slender pedicels with linear minute bracteoles at their bases, collected at the apices of the long, slender stems in compact or lax corymbose cymes. *Involucres* shorter than the florets, their bracts in two rows, the outer very short; the inner 6 or 7, narrowly oblong, blunt, with narrow hyaline margins and dark, thickened midribs. *Cypselas* ·1 in. long, contracted below the apex, but not beaked, compressed, with many smooth or puberulous ribs, equal to or shorter than the soft, white pappus. Hook. fil. Fl. Br. Ind. III. 395; Prain Bengal Plants, 627. *C. lyrata*, Clarke Comp. Ind. 253. *Youngia lyrata*, Cass.; Thw. Enum. Pl. Ceyl. 168. *Youngia Thunbergiana*, *runcinata*, *napifolia*, *Poosia*, *ambigua*, *fastigiata* and *striata*, DC. Prod. VII. 192, 193. *Y. napifolia*, Wight Ic. 1147. *Lactuca napifolia*, DC. in Wight Contrib. 27. *Chondrilla runcinata*, Wall. Cat. 3272. *Prenanthes Poosia* and *napifolia*, Wall. Cat. 3265, 3277. *P. japonica*, Linn. Mant. 107. *P. striata*, Blume Bijdr. 885.

In all the provinces, near or in cultivated ground.

Order LXII. STYLIDIEÆ.

Herbaceous plants, rarely undershrubs. *Leaves* radical or scattered or fasciculate on the stem, more or less subverticillate, entire, often small and narrow, no stipules. *Flowers* in terminal racemes or thyrsoid or corymbose panicles, irregular, perfect, pedicels bracteate. *Calyx-tube* adnate to the ovary; limb 2-lipped, upper lip 3-, lower 2-flowered. *Corolla* gamopetalous, 5-lobed, 4 lobes spreading, the fifth (lip) smaller, irregular, the lobes imbricate. *Stamens* 2, parallel, inserted on a glandular disk surmounting the ovary; filaments connate with the style into a column; anthers sessile on the column, the cells sub-confluent. *Ovary* inferior, 2-celled; style entire or divided into two stigmas; ovules many in each cell, on axile placentas on the middle of the dissepiment, anatropous. *Fruit* a 2-celled capsule, sometimes 1-celled by the suppression of the septum, the valves cohering at the base. *Seeds* minute, numerous, sub-globose; albumen fleshy; testa thin; embryo minute, next the hilum.—DISTRIB. Species about 100, Australian, with a few in tropical Asia, New Zealand, and Antarctic America.

STYLIDIUM, SW.

Herbs, with the habit leaves and inflorescence of the Order. *Calyx-lobes* 5, bilabiate. *Corolla* irregularly 5-lobed, 4 lobes sub-erect in pairs, the fifth smaller, recurved. *Stamens* in an elongate column, often recurved or reflexed, especially when irritated. *Ovary* 2-celled, stigma entire.—DISTRIB. 85 Australian species and 3 Indian or Malayan.

STYLIDIUM TENELLUM, Swartz in Gesellsch. Nat. Berl. Mag. 1807, 51. t. 2, fig. 3, *not of Br.* A small erect herb; stem simple, leafy, glabrous, 4 to 8 in. high, dichotomous, compressed. *Leaves* scattered, alternate, oblong or oblong-obovate, lower ones broader ·2 to ·3 in. long, upper ones narrower, getting gradually smaller upwards and passing gradually into bracts; nerves of lower leaves 3, from the base. *Flowers* sessile, 2 to 5, alternate; bracts minute, linear. *Calyx* bilabiate, upper 3-, lower 2-lobed, lobes linear. *Corolla* irregularly 5-lobed, 4 lobes erect linear, the fifth recurved, spathulate. *Staminal column* exsert, stamens 2, anthers 2-celled, connivent. *Ovary* inferior, elongate, 2-celled, many-seeded, stigma entire. *Capsule* 2-celled, 2-valved, ·5 to ·7 in. long; seeds minute, papillose. DC. Prod. VII. 336; Hook. fil. and Th. in Journ. Linn. Soc. II. 8; Miq. Fl. Ind. Bat. II. 571; Kurz in Flora, 1872, 304. *S. roseum*, Kurz in Journ. As. Soc. Beng. XLV. ii. 137, XLVI. ii. 212; Clarke in Hook. f. Fl. Br. Ind. III. 420.

PENANG: *Ridley* 7103. PROVINCE WELLESLEY, at Butterworth: *G. King*. MALACCA: *Swartz*.—DISTRIB. Eastern Bengal and Burma, in Dacca, Chittagong and Mergui.

S. uliginosum, Swartz, is recorded in Fl. Br. Ind. as from "MALACCA *fide H. f. and T.*"; as we have seen no specimens, we consider it sufficient to record the fact. In Miq. Fl. Ind. Bat. it is *S. Kunthii*, Wall., that is recorded from Malacca, and it seems more likely that this is right as Griffith obtained it at Mergui.

Order LXIII. GOODENOVIEÆ.

Shrubs, undershrubs, but chiefly herbs, juice not milky. *Leaves* alternate or radical, rarely opposite, entire dentate or occasionally pinnatifid; stipules none. *Flowers* hermaphrodite, axillary or in terminal spikes, racemes or panicles, regular or irregular, bracts and bracteoles occasionally present. *Calyx* with the tube adnate to the ovary or free; lobes 5, sometimes very small, sometimes connate in a ring or obsolete. *Corolla* gamopetalous, inserted on the calyx, usually white, yellow or blue, rarely red; lobes 5, valvate, usually induplicate-winged. *Stamens* 5, alternate with the corolla-lobes, inserted on the disk crowning the ovary; free or connate in a ring around the style; anthers 2-celled, the cells parallel, dehiscing longitudinally and introrsely *Ovary* 1–2-celled; style simple with a cup-shaped sheath including the stigma; ovules 1 or many in each cell, erect or ascending, rarely pendulous, inserted on the dissepiment or central. *Fruit* an indehiscent drupe or a capsule with 2 or 4 valves usually dehiscing irregularly. *Seeds* albuminous; testa thin crustaceous or thick and hard; embryo erect in the axis of the fleshy albumen, the radicle inferior.—DISTRIB. Over 200 species, mostly Australian, a few in New Zealand, Antarctic America, the Pacific Islands, or on the coasts of tropical Asia, Africa, and the West Indies.

1. SCÆVOLA, Linn.

Herbs, undershrubs or shrubs. *Leaves* simple, alternate, rarely opposite, entire or toothed. *Flowers* axillary, solitary or in dichotomously branched cymes, sessile or pedicellate. *Calyx* with the tube adnate to the ovary, turbinate, ovoid or globose; limb short, annular or 5-lobed, sometimes obsolete. *Corolla* oblique, split to the base behind, lobes sub-equal or the two uppermost shorter, at length digitately patent. *Stamens* free. *Ovary* 2-celled, with solitary erect ovules in each cell, or 1-celled with 1–2 erect ovules; sheath cupular; stigma truncate or divaricately 2-lobed. *Fruit* an indehiscent drupe, exocarp thin or fleshy, endocarp hard and woody rarely crustaceous. *Seeds* solitary; embryo smooth, cotyledons sometimes broader than the inferior radicle.—DISTRIB. About 60 species, 2 Asiatic, 8–10 of the Pacific Islands and the coasts of Asia, 1 extending to the coasts of Africa and the West Indies, the rest Australian.

SCÆVOLA KOENIGII, Vahl Symb. III. 36 (1794). An evergreen large glabrous shrub with stout stem and branches, soft spongy pith and coarse fibrous wood. *Leaves* alternate, sessile, obovate-oblong, obtuse at apex, decurrent at base, 3 to 6 in. long, about 2 in. broad, entire or obscurely crenate, more or less fleshy when green, membranous when dry, silky pubescent on both sides or somewhat glabrous on the upper surface, tufted hairy in the axils; midrib stout, prominent, broad, main-nerves 10–12 pair, slender, arching upwards and joining near the margin, secondary nerves few slender, reticulations many, indistinct. *Flowers* white, in axillary few-flowered dichotomous pubescent cymes shorter than the leaves; bracts small, subulate, about ·1 in. long; common peduncle ·5 to ·6 in. long; pedicels ·1 to ·2 in. long; bracteoles 2, similar to the bracts. *Calyx-tube* adnate to the ovary, ·2 in. long, densely villous; lobes ·2 to ·3 in. long, linear-lanceolate or spathulate, ciliate, pubescent, enlarged in fruit. *Corolla-tube* ·7 to ·8 in.

long, narrow, pubescent without, villous within; lobes valvately induplicate-winged, ·25 to ·4 in. long, lanceolate, prominently veined, villous-hairy within. *Stamens* erect, free, inserted around the ovary-sheath, ·75 in. long; filaments thin, anthers ovate, introrse, cells parallel, connective produced above with short divergent lobes. *Ovary* 2-celled, crowned with the oblong bifid stigma which is surrounded by a long-fringed sheath; ovules 1 in each cell, erect. *Fruit* a 2-celled ovate-globose succulent drupe, ·3 to ·5 in. in diam., depressed above, ribbed, endocarp bony. Lamk. Ill. t. 124, fig. 2; DC. Prod. VII. 505; Hook. f. and Th. in Journ. Linn. Soc. II. 8; Hook. f. Bot. Mag. t. 2732; Blume Bijdr. 730; Miq. Fl. Ind. Bat. II. 580; Kurz in Journ. As. Soc. Beng. XLVI. ii. 212, For. Fl. II. 84; Clarke in Hook. f. Fl. Br. Ind. III. 421; Trimen Fl. Ceyl. III. 54; Cooke Bomb. Flora, II. 69; Benth. Fl. Austr. IV. 86. *S. sericea*, Forst.; DC. l.c. 506; Blume Bijdr. 750; Miq. Fl. Ind. Bat. II. 581. *S. Taccada*, Roxb. Hort. Beng. 15, Fl. Ind. I. 527; DC. l.c. 505; Dalz. and Gibs. Bomb. Fl. 134; Ham. in Trans. Linn. Soc. XVII. 250; Wall. Cat. 1314; Wight Ill. t. 137. *S. Lobelia*, Ham. in Trans. Linn. Soc. XVII. 250; De Vriese Goodenov. 20–26 and in Ned. Kruidk. Arch. II. 20, *not of Linn. S. Plumieri*, Blume Bijdr. 730, *not of Vahl. S. montana*, Lab. Sert. Austr.-Caled. 41, t. 42; DC. l.c. 506. *S. velutina*, Presl in Rel. Haenck. II. 57; DC. l.c. 506. *S. Bela-Modagam*, Rœm. and Sch. Syst. V. 163; DC. l.c. 505. *S. Leschenaultii*, DC. l.c. 506. *S. macrocalyx*, De Vriese Gooden. 26, tab. 3, figs. 1–4. *S. chlorantha* and *S. Lambertiana*, De Vriese, l.c. 27, 28. *S. lativaga*, Hance in Walp. Ann. II. 1054. *Lobelia frutescens*; Linn. Fl. Zeyl. 148. *L. Taccada*, Gærtn. Fruct. I. 119, tab. 25, fig. 5. *L. Plumieri*, Burm. Fl. Ind. 186, *not of Linn. Cerbera Salutaris*, Lour. Fl. Cochinch. 136. *Buglossum litoreum*, Rumph. Herb. Amb. IV. 116, t. 54. "Béla-Modagam," Rheede Hort. Mal. IV. t. 59.

PENANG: *Wallich* 1314. MALACCA: *Griffith*. JOHORE: *Jensen*. SINGAPORE: *Sir R. Schomburgk* 82; *G. King*; *G. Thomson*.—DISTRIB. Sea-shores of India from Sind to Ceylon; Burma; Malay Islands and eastwards to Australia and Polynesia.

Order LXIV. CAMPANULACEÆ.

Herbs, undershrubs, rarely shrubs; erect or climbing; often with milky juice. *Leaves* alternate or rarely opposite, entire toothed or rarely lobed, no stipules. *Inflorescence* axillary or terminal; flowers solitary, racemose or paniculate; bracts small; bracteoles none (present in *Sphenoclea*). *Calyx-tube* adnate to the ovary, limb few- or many-lobed or -partite, lobes usually persistent in fruit, valvate or imbricate in bud. *Corolla* gamopetalous, tubular, rotate or campanulate, superior, sometimes bilabiate; lobes as many as those of the calyx, valvate or induplicate-valvate, sometimes 1, 2, or all free to the base. *Stamens* equal in number to the corolla-lobes and alternate with them; inserted on the epigynous disk or (in *Sphenoclea*) on the corolla-tube; filaments free or connate in a tube; anthers linear, oblong or ovate, free or connate in a tube, 2-celled, the cells parallel, dehiscing longitudinally and introrsely. *Ovary* usually inferior, 2–5- rarely more-celled; placentas axile, many ovuled; style simple, clavate, within the staminal tube; stigma-lobes as many as the ovary-cells; ovules anatropous, erect horizontal or pendulous. *Fruit* capsular or baccate, crowned by the persistent calyx-lobes, dehiscing vertically or laterally, or indehiscent. *Seeds* very many, small, albuminous; testa thin, coriaceous; embryo erect, radicle inferior.—DISTRIB. Over 1,000 species, scattered throughout the globe, chiefly in temperate regions.

Tribe I. LOBELIEÆ. Corolla 2-lipped, cleft dorsally to the base; anthers connate.

Fruit a capsule, 2-valved at the summit .. .. 1. LOBELIA.

Tribe II. CAMPANULEÆ. Corolla regular; anthers free or imperfectly connate.

Flowers solitary, peduncled .. .. .. 2. CAMPANUMÆA.
Flowers in a dense scorpioid spike .. .. .. 3. PENTAPHRAGMA.
Flowers in a dense cylindric spike .. .. .. 4. SPHENOCLEA.

1. LOBELIA, Linn.

Herbs of various sizes, sometimes very small, sometimes erect and very tall; undershrubs or shrubs. *Leaves* alternate, usually toothed. *Inflorescence* either 1-flowered, in the axils of leaves or bracts, or in a terminal leafy raceme; bracteoles very small or none. *Calyx-tube* adnate to the ovary, turbinate, hemispheric, obovoid or rarely oblong-linear; limb 5-partite or 5-fid, lobes often unequal. *Corolla* oblique, 2-lipped; upper lip 2-, lower 3-partite or -lobed. *Staminal tube* free from the corolla or adnate only at the base; anthers with 2 lower tipped with bristles, 3 upper naked, or else all penicillate. *Ovary* inferior, 2-celled; placentas hemispheric; ovules numerous; stigma shortly bifid. *Capsule* loculicidally 2-valved within the calyx-tube. *Seeds* very many, minute, ellipsoid, compressed or trigonous.—DISTRIB. About 200 species, throughout the world, though scarce in Europe and Western Asia.

LOBELIA AFFINIS, Wall. Cat. 1311. A prostrate often rooting herb with much-branched stem, pubescent or glabrate. *Leaves* ovate-rotundate, acute at apex, rounded or truncate or cordate and more or less decurrent at base, ·5 to 2 in. long, ·5 to 1·5 in. broad, mucronate-dentate or -crenate, membranous, usually strigosely hairy on the nerves especially beneath, sometimes nearly glabrous; midrib slender, main-nerves 4–6 pairs; petiole ·3 to ·6 in. long, more or less winged by the decurrent margins of the blade, strigosely hairy. *Flowers* single, on slender pedicels about ·6 to 1 in. long; bracts minute; pedicels usually deflexed in fruit. *Calyx-tube* adnate to the ovary, ribbed, strigose, obconical; lobes 5 linear spreading, ·1 to ·2 in. long, pilose. *Corolla* purple, ·2 to ·25 in. long, 2 upper lobes falcate-lanceolate, 3 lower connate, teeth short. *Staminal tube* as long as or longer than corolla, anthers all penicillate. *Ovary* 2-celled, style long, stigma bifid, lobes rounded, recurved, ovules many. *Capsule* ribbed, strigose. *Seed* small, ellipsoid trigonous. DC. Prod. VII. 360; Miq. Fl. Ind. Bat. II. 574; Hook. f. and Th. in Journ. Linn. Soc. II. 27; Clarke in Hook. f. Fl. Br. Ind. III. 424; Trimen Fl. Ceyl. III. 57; Prain Beng. Plants I. 633. *L. zeylanica*, Wall. in Roxb. Fl. Ind. ed. Carey and Wall. II. 113; Kurz in Journ. As. Soc. Beng. XLVI. ii. 211, *not of Linn. L. subcuneata*, Miq. Fl. Ind. Bat. II. 574. *L. succulenta* and *L. Heyneana*, Bl. Bijdr. 728.

PENANG: *Ridley* 7162, 10185; *J. Scott.* PERAK: *Ridley* 2902; *Curtis* 2025; *Scortechini* 309, 344; *King's Collector* 2376. SINGAPORE: *Kurz.*—DISTRIB. Eastern Bengal, Burma, Ceylon, Malay Islands, Southern China.

Isotoma longiflora, Presl, is an introduced West Indian plant found in shady places. PENANG: *Deschamps.* SINGAPORE: *Hullett* 29; *Kunstler* 90.

2. CAMPANUMÆA, Blume.

Perennial erect or climbing herbs with tuberous roots. *Leaves* opposite, petiolate, usually cordate. *Flowers* usually large, solitary, peduncled, terminal or axillary on short leafless flowering branches. *Calyx-tube* adnate to the ovary, or below it, persistent, 4- to 6-partite with spreading lobes. *Corolla* broadly campanulate, the base adherent to the calyx-tube, 4- to 6-lobed; white, greenish, or lurid-purple in colour. *Stamens* 4–6, inserted round the base of the corolla-tube; filaments dilated; anthers free. *Ovary* 4–6-celled, placentas thick, many ovuled; style cylindric, stigma 4–6-cleft with short broad lobes. *Fruit* a berry, sub-globose or with truncate top, indehiscent. *Seeds* very many, small, ellipsoid.—DISTRIB. 5–6 species, all of Eastern tropical and sub-tropical and temperate Asia.

CAMPANUMÆA CELEBICA, Blume Bijdr. 727. An erect herb reaching 4 to 5 feet in height, with horizontal spreading smooth branches.

Leaves ovate-lanceolate, acuminate, rounded at base or cuneate, often unequal, 3 in. long, ·75 to 1 in. broad, serrate or almost entire, the serratures mucronate; chartaceous; glabrous above, glaucous and glabrous or with scattered pubescence beneath; midrib slender, main-nerves 4–6 pairs at about 30 degrees with the midrib, arching and joining near the margin; petiole short, ·15 to ·25 in. long. *Flowers* solitary, terminal or in the forks of a dichotomous cyme; peduncles ·3 to ·5 in. long, those of terminal flowers shorter; bracts small linear. *Calyx-tube* in bud shortly adnate to the ovary, in fruit often half-way up; teeth ·2 to ·3 in. long, linear-lanceolate, often serrate. *Corolla* epigynous, shortly campanulate, white or yellowish-white, ·3 to ·5 in. long; lobes 5, triangular acute. *Stamens* ·15 in. long; anthers linear, ·05 in. long, filaments dilated. *Ovary* 5–6-celled; style thickened upwards, then cylindric, angled; stigma about 4-cleft. *Berry* ·3 to ·4 in. in diam., globose, white, slightly succulent, becoming nearly dry, breaking up irregularly. *Seeds* very many, minute, ovoid, flattened, testa smooth. A. DC. Monog. Camp. 120, Prod. VII. 423; Clarke in Hook. f. Fl. Br. Ind. III. 436; Prain Beng. Plants I. 634. *C. truncata*, Endl. Gen. Pl. I. 515. *Codonopsis truncata*, Wall. Cat. 1301; DC. l.c. 123; Miq. Fl. Ind. Bat. II. 566. *C. leucocarpa* and *C. celebica*, Miq. l.c. II. 565, 566. *C. albiflora*, Griff. Notul. IV. 279. *Cyclocodon lancifolium*, Kurz in Flora 303; Journ. As. Soc. Beng. XLVI. 210, *partly*. *C. truncatum*, Hook. f. and Th. in Journ. Linn. Soc. II. 18. *C. adnatus*, Griff.; Benth. in Gen. Pl. II. 558. *Campanula lancifolia*, Roxb. Fl. Ind. I. 505; DC l.c. 485.

PENANG: *Curtis* 2089. PERAK: *Wray* 3236; *Scortechini*.—DISTRIB. India from the Sikkim Himalaya to Chittagong and Burma, Malay Islands, Southern China.

3. PENTAPHRAGMA, Wall.

Fleshy perennial herbs, with short, often rooting, little-branched stems. *Leaves* alternate, broad, rounded, sometimes very unequal at the base, petioles rather long. *Inflorescence* of axillary or lateral dense bracteate scorpioid spikes or racemes, the flowers generally in pairs between the bracts. *Calyx-tube* adnate to the ovary; lobes 4–5, superior, obtuse, persistent, unequal in size. *Corolla* campanulate, the tube short, lobes 4–5. *Stamens* 5 alternate with the corolla-lobes, epigynous or on the corolla tube; anthers ovate or oblong; filaments dilated, curved outwards when open. *Ovary* 3–5-celled; style short, cylindric; stigma large, cylindric or conical, obscurely 4–5-lobed; placentas bifid, ovules many. *Fruit* a more or less succulent berry, dehiscence unknown (*cf.* Roxb. Fl. Ind. I. 506). *Seeds* very many, small, ellipsoid, testa reticulate-rugose.—DISTRIB. About 7 species, all from the Malay Archipelago and Peninsula.

Leaves markedly serrate, very unequal-sided .. ... 1. *P. begoniæfolium.*
Leaves entire or only slightly dentate, nearly or quite equal-sided :—
  Stem short, flower spikes from upper axils, calyx and corolla usually 5-lobed .. .. 2. *P. Scortechinii.*
  Stem elongate, flower spikes from lower axils, calyx and corolla usually 4-lobed .. .. 3. *P. Ridleyi.*

1. PENTAPHRAGMA BEGONIÆFOLIUM, Wall. Cat. 1313. A short-stemmed fleshy herb, with flexuose rooting stems and few branches covered with crispate ferruginous woolly hairs. *Leaves* alternate, ovate, the base obliquely excised on one side, cordate on the other, shortly acuminate at apex, 6 to 10 in. long, 4 to 5 in. broad, coarsely serrate, sparsely crispate-villous; midrib thick, near the excised side, main-nerves 1 on the excised side, 4–5 on the other, the nerves again branching outwards; petiole ·3 to 1 in. long, crispate-villous as are the nerves beneath. *Inflorescence* a short, 1 to 4 in. long, scorpioid, shortly peduncled spike, with 2-ranked flowers between ovate membranous bracts ·25 in. long, axillary in the uppermost leaves; flowers dull yellow supported by an oblong or spathulate villous bracteole ·2 in. long, ·1 in. broad. *Calyx-tube* adnate to the ovary, ovoid, crispate villous; lobes 5 obtuse, rounded, recurved, shorter than the tube, crispate villous without, glabrous within. *Corolla* white, campanulate, 5-lobed, the lobes spreading and recurved, marcescent, oblong obtuse glabrous. *Stamens* 5, free, ·1 to ·125 in. long; anthers oblong, filaments dilated at base. *Ovary* turbinate, 3-celled; ovules many, on axile placentas; style short, stigma cylindrically peltate, obscurely 3-lobed. *Fruit* a berry, dehiscence not known; seeds very many, testa prominently reticulate. DC. Prod. VII. 495; Hook. f. and Th. in Journ. Linn. Soc. II. 26; Miq. Fl. Ind. Bat. II. 568; Kurz in Journ. As. Soc. Beng. XLVI. ii. 210; Clarke in Hook. f. Fl. Br. Ind. III. 437; Baillon Hist. des Plantes, VIII. 323, t. 152–154; Schönl. in Engl. and Pr. Nat. Pflz.—Fam. IV. 5, 60, fig. 37. *Phyteuma begonifolium*, Roxb. Hort. Beng. 85, Fl. Ind. I. 505; Jack in Hook. Bot. Misc. I. 276, t. 57.

PENANG: *Wallich* 1313; *Maingay* 2266 (K.D. 712); *Stoliczka; Deschamps; Hullett* 200; *Kunstler* 1598. PERAK: *Scortechini* 336 (*part*); *Wray* 3668. SINGAPORE: *Lobb.*—DISTRIB. Mergui, *Griffith.* A plant of the undergrowth in dense shady forests. Ridley (Trans. Linn. Soc. III.) (1893, 315) says that it "grows on rocks along the Tahan River, and also far in the woods, in rocky valleys, common."

2. PENTAPHRAGMA SCORTECHINII, n. sp., King & Gamble. A

short-stemmed fleshy herb, creeping and rooting below, afterwards erect; branches flexuose, more or less crispately pilose. *Leaves* alternate, ovate or oblong-ovate, blunt or very shortly acuminate at apex, usually cuneately narrowed below and partly decurrent, sometimes slightly excised on one side; 4 to 10 in. long, 2 to 6 in. broad, entire or faintly dentate, margin often recurved, fleshy, glabrous or slightly rough above, crispately pilose and pale beneath; midrib very thick, sometimes slightly to one side, main-nerves about 4 pair, arched upwards and again branched; petiole thick, 2 to 3 in. long, crispately pilose. *Inflorescence* a short, 1 to 2 in. long, scorpioid, very shortly peduncled spike, with 2-ranked flowers between ovate obtuse bracts, axillary either singly or in pairs from the axils of upper leaves, or lateral below them; flowers white with a yellow centre, bracteole wanting. *Calyx-tube* adnate-to the ovary, ovoid, villous without; lobes 5, ovate obtuse, unequal in size, ·15 to ·2 in. long, 3-nerved. *Corolla* campanulate, tube short; lobes 5 spreading and recurved, marcescent, glabrous. *Stamens* free, ·05 to ·1 long, recurved; anthers linear; filaments narrowly winged. *Ovary* turbinate, 3-celled; ovules many immersed in fleshy axile placentas; style short, stigma conical, obscurely lobed. *Fruit* a berry, apparently indehiscent; seeds very many, ellipsoid, papillose-reticulate.

PERAK: *Scortechini* 336; *Wray* 352, 389; *King's Collector* 958, 2653. PAHANG: *Ridley*. Dense forest undergrowth in the hills at 2,000–4,000 feet, in moist places.

VAR. *parvifolia*, King & Gamble, a smaller more erect plant, scarcely more than 6 in. high; much less villous, the leaves smaller, oblong, obtuse or slightly acute, 4 in. long and 2 in. broad; the inflorescence shorter and the flowers smaller.

PAHANG, at Salian River: *Ridley*. SINGAPORE, at Bukit Timah: *Ridley*.

VAR. *flocculosa*, King & Gamble, leaves ovate rotundate, thick, younger ones densely clothed beneath with crispate villous felt, margins recurved; the main-nerves rarely more than two pairs, all starting from close to the base. *Inflorescence* short, much curved, usually supported by a pair of rounded reduced leaves. *Corolla-lobes* prominently recurved. *Anthers* oblong, cells often divaricate.

PERAK: *Scortechini*. JOHORE, at Goonong Pulai, 1,800 feet: *G. King*.

This species is a very variable one, and some forms almost run into *P. begoniæfolium*. Owing to the calyx and corolla being persistent and more or less marcescent, they vary much in size in different flowers on the same plant, and it is difficult to find characters for the varieties, one or both of which may eventually prove to be separate species.

3. PENTAPHRAGMA RIDLEYI, n. sp., King & Gamble. A fleshy herbaceous plant, 10 to 12 in. in height; stem ·25 in. thick, smooth, at first creeping afterwards erect. *Leaves* ovate, equal-sided, bluntly acute at apex, cuneate at base, 6 to 8 in. long, 3·5 to 4·5 in. broad, glabrous on both surfaces, entire or only very minutely dentate on the margin; midrib broad, main-nerves 4–5 pairs nearly straight, slanting upwards; petiole 1 in. long. *Inflorescence* a short, 1 to 1·5 in. long, nearly sessile spike, with 2-ranked flowers between ovate-spathulate usually 3-nerved glabrous pale bracts; each flower with a ·15 in. long, linear-spathulate, 1-nerved bracteole, ciliate at tip; flowers small, ·2 to ·25 in. long, *Calyx-tube* adnate to the ovary; lobes 4–5, equal or unequal in size, usually ·1 in. long, 3-nerved, the nerves arching. *Corolla-tube* short, lobes 4–5, linear-oblong, emarginate, recurved, glabrous without, minutely pubescent within, white spotted at base with purple, nerves 3. *Stamens* adnate at base to the corolla-tube, ·05 to ·07 in. long, anthers club-shaped, filaments dilated below. *Ovary* turbinate, 3-celled; ovules many on axile placentas; stigma rounded, 3–5-lobed, on a very short conical style. *Fruit* a berry, conical at top, apparently indehiscent; seeds rather few and large; testa beautifully reticulate.

SINGAPORE: *Ridley* 103.—In damp ravines at Bukit Timah (Herb. Kew).

4. SPHENOCLEA, Gaertn.

An annual erect glabrous herb, of marshy places. *Leaves* alternate, lanceolate, entire. *Flowers* in dense cylindric terminal or leaf-opposed peduncled spikes; very small, sessile, each with one bract and two bracteoles. *Calyx-tube* adnate to the ovary, turbinate or hemispherical; lobes 5, sub-foliaceous. *Corolla* campanulate, 5-lobed, valvate. *Stamens* 5, inserted on the base of the corolla; filaments shortly dilated; anthers short, free. *Ovary* semi-inferior, 2-celled; placentas axile, bearing many ovules; style short, stigma obscurely 2-lobed. *Capsule* semi-inferior, depresso-globose, circumsciss at the margin of the calyx-tube, the crown and calyx-lobes deciduous. *Seeds* very numerous, minute, oblong. A single species.

SPHENOCLEA ZEYLANICA, Gaertn. Fruct. I. 113, t. 24, fig. 5. An erect annual herb, 1 to 2 feet high. *Leaves* alternate, lanceolate, narrowed at both ends, 2 to 3 in. long, ·25 to 1 in. broad, entire, sessile or shortly petioled, smooth, midrib and main-nerves faint. *Flowers* in dense, cylindric, terminal or leaf-opposed, peduncled spikes; peduncles ·5 to 1 in. long; spikes ·5 to 1·5 in., bract and bracteoles very small. *Calyx-tube* adnate to the ovary, turbinate or hemispherical, lobes 5, ovate, ·05 to ·06 in. long, somewhat enlarged in fruit and inflexed over the disk. *Corolla* campanulate, 5-lobed, ·07 to ·1 in. long, greenish-white, lobes short, rounded. *Stamens* 5, inserted at the base of the corolla-tube; filaments short dilated; anthers 2-celled, rounded, about as long as filaments. *Ovary* semi-inferior, 2-celled; placentas axile, stalked, bearing many ovules; style short, stigma obscurely 2-lobed. *Capsule* depressed-globose, circumsciss at the margin of the calyx-tube, the crown and calyx-lobes deciduous. *Seeds* very numerous, oblong, minute, scabrous; testa reticulate with rectangular cells. Wall. Cat. 1516; Roxb. Fl. Ind. I. 507, Fl. Ind. ed. Carey and Wall. II. 116; Miq. Fl. Ind. Bat. II. 569; Kurz in Journ. As. Soc. Beng. XLVI. ii. 209; Clarke in Hook. f. Fl. Br. Ind. III. 438; Trimen Fl. Ceyl. III. 519; Baillon Hist. des Plantes, VIII. 327, t. 158–161; Cooke Bomb. Flora, II. 75; Prain Beng. Plants I. 635; Schönl. in Engl. and Pr. Pflz—Fam. IV. 5, 61, fig. 38. *S. Pongatium*, A. DC. Prod. VII. 548; Wight Ill. t. 138. *Pongatium indicum*, Lamk. Ill. II. 444; Encyc. Meth. Bot. V. 564. *Gaertnera Pangati*, Retz Obs. VI. 24. *Rapinia herbacea*, Lour. Fl. Cochinch. (ed. Willd.) I. 157. *Sphenoclea*, Griff. Notul. IV. 276. "Pongati," Rheede Hort. Mal. XI. 47, t. 24.

MALACCA: *Griffith*.—DISTRIB. Swampy places and wet fields, and along river banks in tropical regions of both hemispheres.

Order LXV. VACCINIACEÆ.

Shrubs or small trees, often epiphytic, with stems swollen at the base. *Leaves* alternate or in pseudo-whorls, entire dentate or serrate, evergreen, ex-stipulate. *Flowers* in terminal or axillary racemes, or solitary and axillary, hermaphrodite, usually regular; pedicels 1-bracteate and also often with 2 bracteoles, often articulate beneath the ovary. *Calyx* campanulate or cupular, the tube adherent to the ovary, its limb persistent on the fruit, usually 5-toothed. *Corolla* tubular (sometimes inflated), campanulate or globose, 5-toothed or 5-lobed, usually imbricate, deciduous. *Stamens* 10, epigynous, inserted at the base of the corolla-tube; anthers opening by apical pores, or often produced into 2 tubes, opening by slits, filaments flattened, free or connate by their bases. *Ovary* inferior, crowned by an epigynous disk, 5-celled or falsely 10-celled; style cylindric; stigma simple; ovules many (rarely few), the placentas axile or pendulous from the upper inner angle of each cell. *Fruit* baccate, rarely dry, 5- or falsely 10-celled. *Seeds* numerous or few (rarely only 1) in each cell, small, compressed, albuminous. Species about 350, natives chiefly of cold and temperate regions throughout the world.

Corolla long and tubular or campanulate, with long segments :—
  Calyx-tube terete .. .. 1. AGAPETES.
  Calyx-tube 5-winged or 5-angled .. .. .. 2. PENTAPTERYGIUM.
Corolla small, campanulate or ovoid, its lobes short .. 3. VACCINIUM.

1. AGAPETES, D. Don.

Shrubs, often epiphytic, the stems often much swollen near the base. *Leaves* usually coriaceous, alternate, sometimes in pseudo-whorls, from linear to elliptic, entire or toothed, sessile or with short petioles, often glandular near the base. *Flowers* axillary, solitary, corymbose or in fascicles ; the pedicel often thickened or articulate under the ovary, bracts small. *Calyx* globose, the limb with 5 persistent teeth or lobes. *Corolla* tubular or campanulate, the limb with short or long lobes, red, but often with transverse marks or with greenish-white lobes. *Stamens* 10, usually with short filaments ; *anthers* oblong, each with 2 long apical processes, opening by pores or slits, often spurred behind. *Disk* pulvinate, often lobed. *Ovary* 5-celled or falsely 10-celled ; style cylindric ; stigma capitate ; ovules numerous. *Berry* globose, nearly dry or succulent, 5- or 10-celled, sometimes opening by pores round the disk within the calyx-teeth. *Seeds* numerous, ellipsoid, testa lax.—DISTRIB. 30 species, mostly Himalayan, a few Malayan.

AGAPETES GRIFFITHII, Clarke in Hook. f. Fl. Br. Ind. III. 449. An epiphytic shrub, 3 to 15 feet long, with a tuberous stem ; young branches half as thick as a goose-quill, terete, glabrous. *Leaves* thinly coriaceous, oblong-lanceolate to ovate-lanceolate, always caudate-acuminate, the base rounded, both surfaces pale olivaceous-brown when dry, glabrous, minutely reticulate ; main-nerves 5 or 6 pairs, curved, ascending, faint on both surfaces ; length 3·5 to 6 in. ; breadth 1 in. to 2·65 in. ; petiole ·15 in. long or under. *Flowers* ·3 to ·4 in. long, axillary, always on slender pedicels four or five times as long as themselves, with 1 or 2 narrow bracteoles near the base, glabrous, axillary, solitary, in pairs or in lax racemes. *Calyx* ·1 to ·2 in. long (enlarging in fruit), campanulate, with 5 deep spreading triangular lobes. *Corolla* ·25 in. long, tubular-campanulate, the mouth with 5 triangular sub-erect acute lobes. *Anthers* inserted at the base of the corolla-tube, linear, with 2 long apical beaks dehiscing longitudinally, and 2 posteriorly-projecting curved spurs ; filaments shorter than the anthers, hairy. *Fruit* globular, glabrous, crowned by the small inflexed calyx-lobes. *Seeds* about 20, compressed, tubercled, black.

MALACCA : *Griffith.* PERAK : at elevations of 2,800 to 4,000 feet, *Wray* 1071 ; *King's Collector* 3831, 6363, 8051 ; *Ridley* 5532 ; *Scortechini.*

2. Pentapterygium, Klotsch.

Shrubs, often epiphytic and with stems much thickened at the base. *Leaves* alternate, ovate or lanceolate, sub-entire or toothed, coriaceous, often with glands at the apex of the petiole. *Flowers* axillary, solitary, fascicled or corymbose; the pedicels thickened near the apex, cupular and jointed under the ovary, bracts small. *Calyx-tube* large, tubular, with 5 wings or prominent angles; its lobes 5, enlarged in fruit. *Corolla* tubular, the mouth with 5 short lobes, coloured red or yellow, and often transversely marked. *Stamens* 10, epigynous, the filaments short; anthers elliptic, produced into 2 long beaks, opening by apical pores or slits, and often spurred behind. *Ovary* 5-celled or spuriously 10-celled; style cylindric, often exserted; stigma sub-capitate; ovules very numerous. *Fruit* baccate, 5-winged or 5-ribbed, 5-celled or spuriously 10-celled. *Seeds* numerous, ellipsoid. —Distrib. About 6 species, natives of Eastern Himalaya, Khasia, Malay Peninsula.

Pentapterygium Scortechinii, n. sp., King & Gamble. A sarmentose shrub, 4 to 10 feet long, growing on rocks or trees; young branches somewhat thinner than a goose-quill, terete, glabrous, pale brown when dry. *Leaves* thickly coriaceous, ovate to ovate-rotund, the apex blunt or sub-acute, the base broad and rounded but sometimes slightly emarginate, the edges much recurved when dry; upper surface shining, glabrous, pale olivaceous-brown; the lower darker; midrib strong, deeply depressed on the upper surface, prominent on the lower; main-nerves about 4 pairs, spreading, the two lower much the larger, all curved, mostly depressed on the upper surface and prominent on the lower; length 1·75 to 3 in.; breadth ·8 to 2 in.; petioles ·25 to 4 in. *Flowers* 1 in. long, few together, in axillary or terminal corymbs; their pedicels about ·6 in. long, with 1 or more linear bracts at the base. *Calyx* inflated, tubular, narrowed towards the mouth, glabrous, lobes of the mouth triangular, acute, erect, the lower half of the tube attached to the ovary. *Corolla* inserted on the concave disk of the ovary, slightly exserted from the calyx, tubular, inflated towards the middle; lobes of the mouth short, lanceolate, reflexed; tube with rufous pubescence outside, glabrous within; style cylindric, glabrous, slightly exserted. *Fruit* unknown.

Perak, at elevations of about 4,500 feet: *King's Collector* 8152; *Wray* 210; *Scortechini* 309.

3. Vaccinium, Linn.

Shrubs, sometimes epiphytic. *Leaves* usually small, alternate, but sometimes in pseudo-whorls, from lanceolate to ovate, entire or serrate.

Flowers usually small, axillary or terminal, in racemes fascicles or corymbs rarely solitary, usually bracteate and bracteolate. *Calyx-tube* globose, its teeth 4 or 5, small. *Corolla* urceolate, tubular or ovoid, 5-lobed, pink white or greenish-yellow. *Stamens* 8 or 10, free, inserted near the base of the corolla-tube; anthers oblong, with two apical cylindric tubes dehiscing by terminal slits, sometimes appendiculate at the base (apical tubes very short in one or two species). *Disk* cushion-shaped, convex, sometimes lobed. *Ovary* 4- or 5-celled, or falsely 8–10-celled; style cylindric; stigma simple; ovules few or several in each cell. *Fruit* a more or less globose berry, crowned by the persistent calyx-lobes, 5-celled or falsely 10-celled. *Seeds* small, 1 or more in each cell, ellipsoid, compressed; testa firm, smooth.—DISTRIB. Species about 140, in the Northern Hemisphere or on mountain ranges in the tropics.

Leaves broadly elliptic, ovate-rotund or oblanceolate, the apex broad, sometimes minutely apiculate but never acute, very coriaceous:—
  Leaves under ·75 in. in length, elliptic or obovate-elliptic; corolla ·3 in. long, tapering to the mouth; a small glabrous tree or bush .. .. 1. *V. Scortechinii.*
  Leaves under 1 in. in length, ovate or elliptic; corolla ·2 to ·25 in. long, the mouth wide, truncate; an epiphytic shrub, glabrous except the scurfy branches .. .. 2. *V. microphylla.*
  Leaves elliptic, their apices sub-obtuse, the base truncate or minutely cordate, 1 to 1·35 in. long; flowers enveloped in large deciduous bracts .. .. .. 3. *V. glabrescens.*
  Leaves broadly oblanceolate or spathulate, much narrowed to the base .. .. 4. *V. viscifolium.*
Leaves obovate-elliptic, slightly narrowed to the apex but never acuminate, coriaceous; flowers ·35 in. long, in axillary racemes .. .. 5. *V. Teysmanni.*
Leaves elliptic to elliptic-oblong, sub-acute acute or acuminate:—
  Leaves entire:—
    Leaves glabrous:—
      Leaves coriaceous:—
        Leaves with 4 or 5 pairs of main-nerves; flowers ·2 in. long, in axillary and terminal racemes: mouth of corolla entire or obscurely toothed; a shrub or small tree; anthers with short broad beaks .. .. 6. *V. bancanum.*
        Leaves with 3 pairs of main-nerves; corolla ·2 in. long; its mouth with 5 short, broad, recurved lobes; beaks of anthers truncate, shorter than the cells, epiphytic .. .. .. 7. *V. Kunstleri.*
      Leaves sub-coriaceous, their main-nerves 3 pairs; flowers ·35 in. long; beaks of anthers more than twice as long as the cells; epiphytic .. ... 8. *V. Hasseltii.*

Leaves pubescent or puberulous beneath :—
Leaves coriaceous, oblong-lanceolate or elliptic-lanceolate, with very long caudate acuminate apices; under surface pubescent or puberulous .. .. 9. *V. acuminatissimum.*
Leaves serrate (sometimes faintly so) sub-coriaceous, glabrous; flowers ·3 in. long; beaks of anthers twice as long as the cells .. .. 10. *V. malaccense.*

1. **Vaccinium Scortechinii**, n. sp., King & Gamble. A small tree or large shrub; young branches rather thicker than a crow-quill, dark and much angled when dry, glabrous. *Leaves* small, coriaceous, elliptic or obovate-elliptic, the apex rounded, the base slightly cuneate, the edges much recurved; upper surface olivaceous-brown, shining when dry; the lower brown, dull, faintly reticulate; sparsely scaly; main-nerves a single pair, rarely 2 pairs, curving upwards, converging at their apices, faint on both surfaces; the midrib depressed on the upper surface, prominent on the lower; length ·3 to ·45 in.; breadth ·25 to ·35 in.; petiole very short. *Flowers* about ·35 in. long, solitary, axillary, their pedicels less than ·1 in. long, minutely bracteate at the base, pubescent like the outside of the calyx and corolla. *Calyx* campanulate, the 5 teeth triangular, acute, erect. *Corolla* about ·3 in. long, cylindric, inflated below and tapering to the mouth; the lobes short, broad, blunt, erect or reflexed. *Stamens* 10, each with 2 apical truncate beaks shorter than themselves, but no basal processes; filaments longer than the anthers, hairy. *Ovary* with a flat top, 5-celled, each cell with several ovules. *Style* cylindric, nearly as long as the corolla, pubescent in its lower third, otherwise glabrous. *Fruit* globular, crowned by the inflexed calyx-lobes, tomentose, many-seeded; seeds not compressed.

Perak: *Scortechini; Wray*, at elevations of 6,000 and 6,700 feet, 888 and 356; *King's Collector* 8028.

By the fall of the leaves, in the axils of which they are produced, the flowers appear as if they were in racemes. This closely resembles *V. buxifolium* and *V. coriaceum*, Hook. fil., of which figures are given in Hook. Ic. Pl. t. 891 and 892, but this has much narrower flowers and broader leaves than either.

2. **Vaccinium microphyllum**, Blume Bijdr. 851. Epiphytic on tall trees; a small much-branched shrub; young branches as thick as a crow-quill, with small black deciduous scurf. *Leaves* coriaceous, ovate or elliptic, the apex and base blunt, the former sometimes with a minute apiculus; upper surface bright olivaceous and shining when dry, the lower pale-brown and dull, both faintly reticulate when dry; main-nerves usually a single pair, curving upwards from the base of the midrib and passing to near the apex a little inside the edges, depressed like the midrib on the upper surface when dry, but very faint on the lower;

length ·5 to ·75 in.; breadth ·3 to ·5 in.; petioles about ·05 in. long, hairy. *Flowers* ·2 to ·25 in. long, axillary, usually solitary, decurved: pedicels ·05 in. long, or less. *Calyx* inferior, about ·2 in. across, flat, deeply divided into 5 broadly triangular, sub-acute, spreading lobes. *Corolla* glabrous, widely cylindric-campanulate, deeply cut into 5 broadly triangular acute or sub-acute erect lobes. *Stamens* 10, from the base of the corolla; anthers oblong, each with an apical process shorter than itself but with no basal appendage; filaments shorter than the anthers, curved, expanded at the base. *Ovary* superior, broad with flat apex. *Style* cylindric, as long as the corolla; stigma capitate; ovules few in each cell. *Fruit* globular, surrounded by and adherent to the calyx, ·2 in. in diam. Miq. Fl. Ind. Bat. II. 1063. *Diplycosia microphylla*, Beccari, Malesia 212; Clarke in Hook. f. Fl. Br. Ind. III. 458.

MALACCA: *Griffith* (K.D.) 3484; *Maingay* (K.D.) 700; *Lobb.* PERAK, at elevations of 3,000 feet: *Wray* 470, 1105; *Scortechini* 1171; *King's Collector* 3660, 6390. KEDAH: *Ridley* 5528, 5529.—DISTRIB. Borneo, Celebes, Ternate.

3. VACCINIUM GLABRESCENS, n. sp., King & Gamble. Epiphytic; young branches rather thicker than a crow-quill, dark-coloured when dry, minutely pubescent. *Leaves* coriaceous, elliptic, the apex sub-obtuse, the base sub-truncate and minutely cordate; upper surface dark olivaceous-brown when dry, reticulate, smooth, shining; lower surface brown when dry, minutely pubescent like the petiole (glabrescent when old); main-nerves 3 or 4 pairs, pinnate, ascending, rather straight; length 1 to 1·35 in.; breadth ·6 to 1 in.; petiole under ·1 in. long. *Racemes* solitary, terminal, 3 or 4 times longer than the leaves, bearing at the base of each flower a large lanceolate pubescent deciduous bract ·4 in. long and about ·2 in. broad at the middle. *Fruit* sub-rotund or ellipsoid, baccate, softly and minutely pubescent, crowned by the inflexed triangular calyx-teeth, ·2 in. long and ·15 in. in diam., 5-celled, each cell with several angled seeds.

PERAK: *Scortechini* (without number).

4. VACCINIUM VISCIFOLIUM, n. sp., King & Gamble. Young branches half as thick as a goose-quill, striate and pale-brown when dry. *Leaves* very coriaceous, broadly oblanceolate or spathulate, the apex very blunt, narrowed from below the middle to the short flattened petiole, the edges slightly recurved; upper surface olivaceous when dry, the lower bright brown, both glabrous; main-nerves 2 or 3 pairs, originating from the midrib near its base, ascending, little curved, very prominent like the midrib on the upper surface but faint on the lower; length 2 to 2·75 in.; breath ·8 to 1·25 in.; petioles about ·1 in. *Racemes* terminal and axillary, often forming, from the fall of the leaves, pseudo-

panicles several times longer than the leaves. *Flowers* not seen. *Fruit* on curved deflexed peduncles, ·5 in. in length, globular, baccate, ·2 in. in diam., crowned by the persistent disk and by the 5 minute triangular calyx-teeth, 10-celled, the cells with more than one small angled seed.

PERAK: *Scortechini* 405; *Wray*, at an elevation of 6,700 feet, 328.

VAR. *minor*, King & Gamble. Leaves only 1·2 to 1·6 in. in length, their 3 or 4 pairs of nerves not so much from the base of the midrib; racemes not much longer than the leaves; fruit only ·15 in. in diam.; pedicels under ·2 in. long.

PERAK, at elevations of 5,000 feet: *Scortechini* 404; *King's Collector* 8020.

5. VACCINIUM TEYSMANNI, Miq. Fl. Ind. Bat. II. 1062. A medium-sized tree; young branches somewhat thinner than a goose-quill, dark-coloured and striate when dry. *Leaves* coriaceous, broadly obovate, often almost rotund-obovate or elliptic, rarely oblanceolate, the apex obtuse or rounded, rarely retuse or sub-acute, the base cuneate and merging in the broad, sometimes glandular petiole; both surfaces glabrous and faintly reticulate, upper olivaceous when dry, shining, the lower dark-brown, the midrib broad on both; main-nerves 4 to 6 pairs, curving upwards and anastomosing freely, more prominent on the upper than on the lower surface; length 2·5 to 3·5 in.; breadth 1·25 to 2·25 in.; petiole ·2 to ·4 in. long. *Racemes* slender, often longer than the leaves, axillary and extra-axillary, their rachises somewhat compressed and angled, often puberulous; pedicels slender, curved, minutely bracteolate or ebracteolate at the base, ·15 to ·2 in. long. *Flowers* ·35 in. long; their pedicels ·15 in. long, decurved or not, puberulous like the outside of the calyx. *Calyx* less than ·1 in. long, campanulate, with 5 acutely triangular spreading teeth. *Corolla* white, puberulous, narrowly cylindric, tapering slightly to the mouth; lobes 5, very short, spreading or reflexed. *Stamens* 8 or 10, included or sub-exserted; anthers narrowly oblong, with 2 long apical spurs, but without basal appendages, shorter than the tapering hairy filaments. *Ovary* hemispheric, deeply grooved; style as long as the corolla, grooved; stigmas 5, very short, linear. *Capsule* unknown.

PERAK: On Gunong Bubu, at elevations of 4,500 feet, *Scortechini* 428, 443; *Wray* 1117, 3909; Curtis 3703.—DISTRIB. Java.

6. VACCINIUM BANCANUM, Miq. Fl. Ind. Bat. Suppl. 587. A small tree; young branches twice as thick as a crow-quill, deciduously puberulous, pale and angled when dry. *Leaves* coriaceous, elliptic to elliptic-oblong, the apex sub-acute acute or acuminate, the base

cuneate; both surfaces yellowish-brown when dry and rather dull, the lower reticulate; the edges slightly recurved or not; main-nerves 4 or 5 pairs, ascending, slightly curved, faint on both surfaces; length 1 to 2·5 in.; breadth ·5 to ·8 in.; petioles ·1 in. long. *Racemes* axillary and terminal, twice as long as the leaves, their rachises puberulous, angled when dry. *Flowers* ·2 in. long; their pedicels slender, decurved, ·1 to ·2 in. long, puberulous, minutely bracteolate at the base. *Calyx* puberulous, cupular, ·15 in. across, deeply divided into 5 triangular sub-acute spreading lobes. *Corolla* ovoid or ovoid-globulose, with truncate, wide, entire, wavy or obscurely toothed mouth, puberulous outside. *Stamens* 10, shorter than the corolla and inserted at its base; anthers short, broad, with 2 short, trumpet-shaped, curved apical processes, opening by wide pores, and, at the base of these processes behind, 2 curved, slender filamentous spurs; the filaments longer than the anthers, flattened, tapering from the base upwards, pubescent. *Ovary* depressed, bearing a slightly convex 10-grooved disk and many hairs. *Fruit* ·2 to ·25 in. in diam., depressed-globular, crowned by the inflexed calyx-lobes, minutely pubescent, 5-celled; seeds numerous, triangular, reticulate, shining. Clarke in Hook. f. Fl. Br. Ind. III. 454. *V. exaristatum*, Kurz in Journ. As. Soc. Beng., 1873, Pt. II. 96; 1877, Pt. II. 215; For. Fl. Burm. II. 91.

PERAK, at elevations of from 5,000 to 6,500 feet: *Wray* 328, 1528, 3912; *King's Collector* 7018. MALACCA: Mount Ophir, *Moxon*; *Maingay* (K.D.) 699.—DISTRIB. Bangka.

7. VACCINIUM KUNSTLERI, n. sp., King & Gamble. Epiphytic; everywhere glabrous; young branches one-third of the thickness of a goose-quill, dark and striate when dry. *Leaves* coriaceous, lanceolate or narrowly elliptic, the apex acuminate, the base much narrowed, the edges slightly recurved; both surfaces brown when dry, the upper tinged with olivaceous and reticulate; main-nerves 3 pairs, ascending, little curved, slightly prominent on the upper surface only; length 2 to 2·5 in.; breadth ·5 to ·65 in.; petioles ·1 to ·15 in. long. *Racemes* about as long as the leaves, axillary, minutely bracteolate at the base of the flowers. *Flowers* ·2 in. long, their puberulous pedicels slender, ·1 to ·15 in. long. *Calyx* cupular-campanulate, about ·05 in. long, the limb spreading, wavy, with indistinct broad lobes. *Corolla* tubular-ovoid, ·15 to ·2 in. long, the mouth with 5 broad, blunt, short recurved lobes. *Stamens* 10, slightly shorter than the corolla or as long; anthers small, oblong, each with 2 short, diverging, apical truncate processes, but with none at the base; filaments three times as long as the anthers, tapering, flattened and hairy below, cylindric above. *Ovary* 5-celled, with several ovules in each cell, depressed; disk slightly convex with radiating

grooves; style slightly exserted, hairy below; stigma small. *Fruit* globular, ·2 in. in diam.

PERAK, on Maxwell's Hill, elevation 3,500 feet: *Scortechini* 39, 428; *King's Collector* 8415.

This closely resembles *V. bancanum*, Miq., but it is an epiphyte. Its leaves, moreover, are narrowly elliptic or lanceolate, and they have only 3 pairs of main-nerves. The flowers of this are puberulous, and the mouth of the corolla, instead of being entire, has 5 broad, short, recurved lobes. The apical processes on the anthers are also of a different shape from those in *V. bancanum*.

8. VACCINIUM HASSELTII, Miq. Ann. Mus. Lugd. Bat. I. 40. An erect shrub; young branches twice as thick as a crow-quill, dark-coloured and angled when dry, glabrous. *Leaves* elliptic to elliptic-oblong, thinly coriaceous, glabrous, the apex acuminate (often caudately so); upper surface olivaceous-brown, the lower paler; main-nerves 3 pairs, very slightly curved and erect or ascending, the lower pairs passing almost to the apex, faint but distinct on both surfaces, some of the nerves transverse, the others vertical; length 1·5 to 2·5 in.; breadth ·6 to 1·25 in.; petioles ·2 to ·25 in. long, slender. *Racemes* axillary and terminal, usually slightly longer than the leaves, their rachises at first puberulous but ultimately glabrous, ebracteolate; flower-pedicels slender, curved or straight, about ·15 in. long. *Calyx* shortly cupular, with 5 spreading, broad, sub-acute or blunt teeth. *Corolla* about ·35 in. long, sub-cylindric, narrowing upwards to the mouth; the lobes 5, broad, blunt, erect or reflexed, very short, each bearing a small tuft of hairs. *Stamens* 10, as long as the corolla; anthers oblong, with 2 apical beaks more than twice as long as themselves but with no basal appendages; the filaments shorter than the beaks but longer than the anther-cells, broad and hairy at the base. *Ovary* much compressed, surmounted by a large, much corrugated disk; style as long as the corolla, tapering, boldly ridged. *Fruit* globular, smooth, glabrous, ·3 in. in diam., crowned by the minute calyx-lobes. *V. bancanum*, Miq., var. *angustifolium*, Scheff.

PERAK: *King's Collector* 7515; *Derry* 3702; *Wray* 4012. PAHANG: *Ridley* 1363, 10895. JOHORE: *Ridley* 6316, 6323. SINGAPORE: *Ridley* 3030, 6316A, 8907.—DISTRIB. Bangka.

9. VACCINIUM ACUMINATISSIMUM, Miq. Ann. Mus. Lugd. Bat. I. 36. Epiphytic shrub, 3 to 8 feet long; young branches half as thick as a goose-quill or less, clothed with short cinereous pubescence. *Leaves* coriaceous, oblong-lanceolate to elliptic-lanceolate, the apex caudate-acuminate, the base cuneate, the edges when dry much recurved; both surfaces dark olivaceous-brown when dry: the upper

shining, faintly and minutely reticulate, glabrous except the puberulous midrib, lower surface dull, dark cinereous-puberulous, especially on the midrib and nerves; main-nerves 4 or 5 pairs, unequal, slightly curved, ascending, the second lowest pair much larger than the others and more erect, all (like the midrib) depressed on the upper surface and bold and prominent on the lower; length 3·5 to 5 in.; breadth 1 in. to 1·75 in.; petioles ·15 in. long, pubescent and with several short hispid axillary processes at their bases. *Racemes* axillary, shorter than the leaves, slender, pubescent; flower-pedicels ·1 in. long, pubescent like the calyx, minutely bracteate at the base. *Calyx* when nearly ripe ·15 in. in diam., with an ovoid-globular tube pubescent outside, the mouth with 5 triangular acute incurved lobes. *Corolla* not seen. *Seeds* several, compressed, black, pitted. *Ericacea*, Wall. Cat. 7528.

Perak, at elevations of from 5,000 to 6,000 feet: *Wray* 1159, 1418, 2821; *Scortechini* 472; *King's Collector* 3509, 6734, 7810. Singapore: *Ridley* 6235.—Distrib. Sumatra (*Beccari* 516), Java, Borneo.

10. Vaccinium malaccense, Wight in Calc. Journ. Nat. Hist VIII. (1847) 172. An erect shrub; all parts except the inflorescence glabrous; young branches as thick as a crow-quill, angled, brown when dry. *Leaves* coriaceous, lanceolate or elliptic, the apex acuminate, the base cuneate or acuminate, the edges finely crenate-serrate; both surfaces brown when dry, the lower the paler; main-nerves 4 or 5 pairs, slightly curved, ascending, interarching within the edge, not prominent on either surface; length 1 to 2·25 in.; breadth ·6 to ·9 in.; petioles ·1 to ·15 in. long. *Racemes* axillary and terminal, longer than the leaves, many-flowered, puberulous like the pedicels and flowers; pedicels slender, curved downwards, ·15 in. long (lengthening in fruit), each with 1 concave, lanceolate, caducous bract at its base, and 1 or 2 smaller subulate bracteoles inside it. *Flowers* ·3 in. long. *Calyx* campanulate, under ·1 in. long, its lobes narrowly triangular, acuminate, spreading. *Corolla* ovoid-cylindric, slightly narrowed to the mouth; lobes of limb very short, reflexed. *Stamens* 10, shorter than the corolla; anthers with 2 apical beaks longer than themselves but with no basal processes; filaments longer than the anthers, bulbous and hairy at the base. *Ovary* depressed, the disk thick; style cylindric, ridged, a little shorter than the corolla. *Fruit* depressed-globose, glabrous, ·35 in. broad. Wight Ic. 1186; Miq. Fl. Ind. Bat. Suppl. 587; Clarke in Hook. f. Fl. Br. Ind. III. 454. *Epigynium malaccense*, Klotzsch in Linnæa, XXIV. 50.

Malacca: *Griffith* (K.D.) 3458/1; *Maingay* (K.D.) 698; *Lobb.* Singapore: *Ridley*. Pahang: *Ridley* 1025. Perak: *Ridley* 3605.—Distrib. Bangka, Java, Cochin-China.

Order LXVI. ERICACEÆ.

Shrubs, trees, or perennial herbs. *Leaves* alternate or in pseudo-whorls, ex-stipulate, entire or serrate. *Flowers* in racemes or fascicles or solitary; pedicels bracteate and sometimes bi-bracteolate. *Flowers* regular or (in *Rhododendron*) slightly irregular, hermaphrodite, sometimes dimorphous. *Calyx* free or (in *Diplycosia*) sometimes adnate to the ovary, with 5 rarely 4 or 6, teeth or lobes. *Corolla* hypogynous, persistent or deciduous, campanulate cylindric or urceolate, with 4 or 5 (rarely 6 to 10) imbricate or contorted, rarely valvate teeth or lobes (polypetalous in *Pyrola*). *Stamens* hypogynous or slightly attached to the base of the corolla; 10, or sometimes 5, 8, or 20 (in *Diplycosia* sometimes epigynous); filaments free or united into a tube by their bases; anthers 2-celled, basi- or dorsi-fixed, dehiscing by apical pores or slits, the cells often prolonged into apical tubes, sometimes dorsally spurred. *Disk* various, annular or convex, crenate or lobed, sometimes absent. *Ovary* 5-celled (rarely 4- to 16-celled); style slender, cylindric; stigma capitate or plane, entire or shortly lobed. *Ovules* numerous, rarely few, on placentas in the inner angles of the cells or pendulous from the upper corner. *Fruit* capsular, 5-celled, many-seeded, sometimes appearing baccate from the adherence of the enlarged succulent calyx. *Seeds* many, small, angled or compressed, albuminous; the testa often loose.—DISTRIB. About 1,200, in all parts of the world.

Fruit capsular:—
Capsule 5-valved, loculicidal:—
Calyx surrounding the capsule succulent in fruit:—
Anthers with 2 horns at the apex .. .. .. 1. GAULTHERIA.
Anthers not horned on the apex .. .. .. 2. DIPLYCOSIA.
Calyx not succulent in fruit .. .. .. 3. PIERIS.
Capsule 5- to 20-celled, septicidal, calyx not succulent in fruit;
anthers dehiscing by pores .. .. 4. RHODODENDRON.
Fruit baccate .. .. 5. PERNETTYOPSIS.

1. GAULTHERIA, Linn.

Erect or procumbent shrubs, rarely epiphytic. *Leaves* coriaceous, persistent, alternate, serrate or serrulate, penni-nerved. *Flowers* small, occasionally dimorphic, in axillary or terminal racemes, or axillary and solitary, bracteate and bi-bracteolate. *Calyx* with 5 teeth or lobes, enlarged, succulent and coloured in fruit and enclosing the capsule, and often with 2 simple or connate bracteoles at its base. *Corolla* ovoid-tubular or campanulate, greenish-white or reddish, the mouth with 5 spreading or recurved imbricate lobes. *Stamens* 10, included, attached to the base of the corolla; anthers produced at the apex into 2 tubes, and often also with 1 or 2 dorsal spurs; filaments dilated at the base, usually pilose (in some flowers the stamens small and the anthers without appendages). *Ovary* 5-celled, sometimes 5-lobed; style cylindric; stigma simple; ovules many in each cell. *Capsule* 5-celled, dehiscing loculicidally from the apex, enveloped in the succulent calyx; seeds many, minute, sub-globose, angled.—DISTRIB. Species about 80, mostly American, a few in the mountains of India and Malaya, a few also in Australia and New Zealand.

Leaves elliptic or oblong-elliptic, sub-acute	1. *G. fragrantissima.*
Leaves broadly ovate, caudate-acuminate	2. *G. leucocarpa.*

1. GAULTHERIA FRAGRANTISSIMA, Wall. in As. Research. XIII. 397, *with figure.* A shrub; young branches twice as thick as a crow-quill, 3-angled, glabrous, pale brown when dry. *Leaves* thickly coriaceous, elliptic or oblong-elliptic, sub-acute, the base cuneate, the edges crenate-serrate; both surfaces pale brown when dry and dull, strongly reticulate, the upper always glabrous, the lower with sparse black scales and occasionally a few scattered hairs; length 1·5 to 2·25 in.; breadth ·75 to 1·2 in.; petioles ·15 to ·2 in. *Racemes* axillary, usually longer than the leaves, slender, many-flowered; pedicels ·15 in. long, deflexed, each with a small triangular acute bract at its base and two broader connate ones above its middle. *Flowers* ·2 in. long. *Calyx* campanulate, with 5 deep triangular lobes, puberulous, ·05 in. long or less at first, persistent and increasing to ·2 in. with age. *Corolla* ·15 in. long, widely tubular, the mouth contracted and with 5 short blunt lobes. *Stamens* 10; anthers elongate, included, the apex with 2 deeply bifid apical horns; filaments flattened at the base. *Fruit* depressed-globular, with 5 deep grooves, ·15 in. in diam., minutely pubescent, crowned by the long, persistent, slightly clavate, cylindric style, many-seeded. DC. Prod. VII. 593; Wall. Cat. 765; Wight Ic. 1196; Bot. Mag. t. 5984; Clarke in Hook. f. Fl. Br. Ind. III. 457. *G. fragrans,* Don Prod. 151. *G. punctata,* Blume Bijdr. 850; DC. l.c. 593; Miq. Fl. Ind. Bat. II. 1055; Kurz in Journ. As. Soc. Beng., 1877, II. 215, For. Fl. Burm. II. 92. *G. ovalifolia,* Wall. Cat. 1523. *G. Leschenaultii,* DC. l.c. 593; Wight Ill. t. 141c, and Ic. 1195. *Andromeda flexuosa,* Moon Cat. Pl. Ceyl. 35. *A. kataghérensis,* Hook. Ic. Pl. t. 246. *Leucothoe* (?) *kataghérensis,* DC. l.c. 606.

PERAK, on the summit of Gunong Batu Pateh: *Wray* 879, 1580; *Scortechini* 405 (*in part*).—DISTRIB. British India, Ceylon, Sumatra, Java.

2. GAULTHERIA LEUCOCARPA, Blume Bijdr. 856. A slender climber; young branches as thick as a crow-quill, smooth, glabrous, pale-brown when dry. *Leaves* thinly coriaceous, broadly ovate, shortly rather abruptly and sharply caudate-acuminate, the base broad, emarginate or sub-cordate; edges minutely crenate-serrate; upper surface olivaceous-brown when dry, much and boldly reticulate, the nerves minutely hairy; lower surface pale-brown, reticulate, glabrous; main-nerves 2 to 4 pairs, much curved, ascending, distinct on both surfaces; length 2 to 4 in.; breadth 1 to 2 in.; petioles ·15 to ·2 in. long. *Racemes* slightly supra-axillary, shorter than the leaves, their rachises compressed, glabrous or pubescent; flower-pedicels rather less than ·1 in. long in flower, twice as long in fruit, each with a small ovate concave bract at its base. *Flowers* ·3 in. long; their pedicels rather more than ·1 in. long, deflexed, puberulous, ebracteolate. *Calyx* less than ·1 in. long, puberulous, campanulate, with 5 small spreading sub-acute triangular lobes. *Corolla* sub-cylindric, widest at the base and gradually tapering to the mouth, teeth of the mouth very short, blunt, erect. *Stamens* 10; anthers linear, beaked, shorter than the densely hairy tapering filaments. *Ovary* inferior, depressed-hemispheric, crowned by a thick, very concave, marginally grooved disk; style cylindric, tapering to the apex, glabrous. *Fruit* closely adnate to the calyx-tube, 5-celled, many-seeded. Miq. Fl. Ind. Bat. II. 1056; Beccari Malesia, I. 213.

PERAK, at elevations of 5,000 to 6,700 feet: *Wray* 360, 1573, 4101; *Scortechini* 1348; *King's Collector* 8025.—DISTRIB. Java, Sumatra.

2. DIPLYCOSIA, Blume.

Epiphytic shrubs, glabrous or setose, evergreen. *Leaves* coriaceous, alternate, entire or ciliate-serrate. *Flowers* small, axillary, solitary, on pedicels bracteolate at the base. *Calyx* with 5 teeth or lobes, free or half superior, accrescent in fruit, with 2 basal bracteoles connate into a calyculus. *Corolla* campanulate or urceolate, with 5 slightly imbricate recurved lobes. *Stamens* 10, as long as the corolla, and inserted at its base, quite included or with the tips of the anthers exserted; anthers elongate, oblong, produced at the apex into two straight valvularly-dehiscing tubes, but without dorsal appendages. *Disk* cupular, 10-lobed. *Ovary* 5-celled; style filiform; stigma simple; ovules in the cells numerous, attached to axile placentas. *Fruit* superior or half-superior, included in the succulent accrescent calyx, 2-celled, dehiscing by 5 valves, many-seeded. *Seeds* minute, cuneate; testa lax, reticulate; albumen fleshy; embryo axile, cylindric.—DISTRIB. Species about 14, all Indian or Malayan.

Leaves 2 to 5 in. long :—
  Calyx-lobes broad, blunt .. .. 1. *D. latifolia.*
  Calyx-lobes triangular, acute .. .. .. 2. *D. heterophylla.*
Leaves 1·5 to 2 in. long .. .. 3. *D. erythrina.*

1. DIPLYCOSIA LATIFOLIA, Blume Bijdr. 858. A small glabrous epiphytic shrub ; young branches half as thick as a goose-quill, pale and angled when dry. *Leaves* thickly coriaceous, elliptic, the apex shortly and obtusely acuminate, the base cuneate or somewhat rounded, the edges recurved ; both surfaces pale yellowish-brown when dry, the upper shining, the lower dull ; the midrib bold, much raised on the lower surface, slightly depressed on the upper ; main-nerves 2 or 3 pairs, curving upwards, the lower pair usually longer than the others, none of them very prominent on either surface, but more so on the lower than on the upper, reticulations obsolete ; length 3 to 5 in. ; breadth 1·35 to 3 in. ; petioles ·2 to ·3 in. long. *Flowers* ·2 in. long, in axillary fascicles of 3 or 4 ; their pedicels slender, ·1 to ·15 in. long, inserted 3 or 4 together on minute tubercles surrounded by several small bracts. *Calyx* cupular, ·1 in. across, with 5 broad, spreading, obtuse, ciliolate lobes. *Corolla* ·25 in. long, narrowly campanulate, contracted into a short tube at the base, the limb deeply divided into 5 ovate sub-acute lobes, closely embracing the ovary. *Stamens* 10, included ; anthers narrowly oblong, each with two short apical truncate beaks but no basal processes ; the filaments slender in their upper halves, the lower halves dilated and cohering into a tube. *Ovary* 5-celled, the apex broad, concave ; style cylindric, about as long as the corolla ; stigma small, capitate. *Fruit* 5-celled ; seeds numerous, elongate, black, closely enveloped by the persistent corolla. Miq. Fl. Ind. Bat. II. 1055.

PERAK, at elevations of 6,700 feet : *Wray* 364, 909, 2204 ; *Scortechini* 339 ; *King's Collector* 6797, 8023. SELANGOR : *Ridley* 7556.—DISTRIB. Java.

2. DIPLYCOSIA HETEROPHYLLA, Blume Bijdr. 858. A shrub ; young branches as thick as a crow-quill, coarsely rusty-pilose at first, afterwards sub-glabrous, when dry pale and angled. *Leaves* coriaceous, elliptic oblong-elliptic or lanceolate, acute or acuminate at apex and base, the edges recurved ; both surfaces olivaceous-brown when dry, the upper sub-reticulate and shining, the lower dull and not reticulate ; main-nerves 1 pair following the edge from base to apex, distinct and depressed like the midrib on the upper surface, indistinct on the lower ; length 2 to 4 in. ; breadth 1 to 2 in. ; petiole rather more than ·2 in. long. *Flowers* axillary, fascicled, rarely solitary, about ·15 in. long, bearing under the calyx 2 broadly reniform, acute, spreading concave bracts.

Calyx campanulate, with 5 broadly triangular erect lobes, closely applied to the fruit. *Corolla* widely campanulate, ·2 in. long, the teeth 5, broad, blunt, short, reflexed. *Fruit* superior, sub-rotund, smooth, many-seeded, crowned by the fluted style; seeds oblong, concave, compressed, numerous.

PERAK: *Scortechini.*

3. DIPLYCOSIA ERYTHRINA, King & Gamble. A small tree, 10 to 20 feet high; young branches twice as thick as a crow-quill, glabrous, pale-brown when dry, angled. *Leaves* thickly coriaceous, elliptic, the apex obtuse or sub-acute, the base acute, the edges recurved; both surfaces when dry pale-brown, the upper tinged with olivaceous, not reticulate, quite glabrous; main-nerves 2 to 3 pairs, ascending, rather straight, faint on both surfaces; length 1·5 to 2 in.; breadth ·75 to 1 in.; petioles ·1 in. long, stout. *Racemes* terminal, nearly twice as long as the leaves, with a large narrowly elliptic leaf-like bract ·4 to ·6 in. long, and ·1 to ·2 in. broad at the base of each flower-pedicel; pedicels decurved, ·15 in. long in the flower, rather more than twice as long in the fruit. *Flowers* ·4 in. long. *Calyx* ·2 in. long, campanulate, with 5 spreading triangular acute lobes. *Corolla* ·35 in. long, cylindric, narrowed towards the throat, glabrous; the mouth with 5 short, broad, blunt, recurved lobes. *Stamens* 10, slightly exserted; anthers broadly oblong, with neither apical nor basal appendages; the filaments three times as long, broadening towards the base, pubescent. *Ovary* inferior, its disk convex, hairy; style slightly exceeding the corolla, cylindric; stigma small, capitate. *Fruit* oblong-globose, ·2 in. in diam., surmounted by the inflexed calyx-lobes, sub-glabrous, pericarp leathery; cells 5, each with several angular seeds. *Vaccinium erythrinum*, Hook. Bot. Mag. t. 4688.

PERAK, at elevations of 5,000 feet: *Wray* 3816; *King's Collector* 7349; *Scortechini.*—DISTRIB. Java, Sumatra.

3. PIERIS, D. Don.

Trees or shrubs, with terete branchlets. *Leaves* alternate, petiolate, entire or serrulate, persistent. *Racemes* axillary and solitary, or terminal and in panicles; pedicels bracteate and also with 1 or 2 bracteoles. *Calyx* free, with 5 teeth or lobes; the segments in bud open or valvate. *Corolla* ovoid or elongate-urceolate, with 5 short recurved teeth, white. *Stamens* 10; anther-cells ovoid-truncate; filaments each with 2 divaricate horns from its apex or ex-appendiculate. *Ovary* globose with a lobed disk, 5-celled; ovules numerous; style cylindric; stigma capitellate or truncate. *Capsule* globose, dry, 5-celled, with 5-valved loculicidal dehiscence. *Seeds* many, linear-oblong, falcate, not winged, albuminous; testa loose.—Distrib. Species 10; Himalaya and the mountains of Burma and of the Malayan Peninsula.

Pieris ovalifolia, D. Don in Edinb. Phil. Journ. XVII. (1834) 159. A tree; young branches whitish-puberulous at first, afterwards black and glabrous, about a third as thick as a goose-quill. *Leaves* thinly coriaceous, ovate, shortly acuminate, the base broad and rounded, the edges very slightly recurved; upper surface blackish-brown when dry, glabrous, the lower of a paler brown, minutely reticulate, puberulous on the midrib and nerves; main-nerves 12 to 15 pairs, spreading, curving slightly upwards, sharply prominent on the lower surface, indistinct on the upper; length 4 to 5·25 in.; breadth 2 to 2·75 in.; petiole ·25 to ·3 in. long, puberulous. *Racemes* simple, axillary, 4 to 10 in. long, sometimes by suppression of the leaves forming a terminal false panicle, more or less pubescent; bracts ·2 in. long, linear or lanceolate. *Calyx-teeth* connate at the base. *Corolla* narrowly ovoid, white. *Capsule* globose, glabrous, ·2 in. in diam. *Seeds* small, linear-oblong. DC. Prod. VII. 599; Loudon, Arb. Brit. 570, fig. 1070; Clarke in Hook. f. Fl. Br. Ind. III. 460. *Andromeda ovalifolia*, Wall. Cat. 763, and in Asiat. Research, XIII. 391 (*with fig.*); Don Prod. 148; Wight Ic. t. 1199; Brandis For. Flora, 280; Kurz in Journ. As. Soc. Beng., 1877, Pt. II. 216, For. Fl. Burm. II. 192. *A. elliptica*, Sieb. & Zucc. Fl. Jap. Fam. Nat. II. 126. *Thibaudia*, Griff. Ic. Pl. Asiat. t. 514.

Perak, at an elevation of 5,000 feet: *Wray* 1522.—Distrib. Himalaya up to 8,000 ft.; Khasia Hills; Burma; Japan.

4. Rhododendron, Linn.

Shrubs or trees, often aromatic often scaly. *Leaves* coriaceous, entire, alternate, rarely sub-opposite or in false whorls, often clustered near the ends of the branches. *Flowers* in terminal fascicles or pseudo-corymbs, rarely solitary or axillary; bracts broad, usually caducous, bracteoles linear. *Calyx* persistent, 5-lobed, rarely cupular, sometimes small or obsolete. *Corolla* campanulate, salver-shaped or funnel-shaped, the tube long or short, the limb 5- to 10-lobed. *Stamens* usually 10 but sometimes 5 or 18; anthers oblong, dehiscing by terminal pores. *Ovary* 5- to 20-celled; style long or short, filiform; stigma capitate; ovules numerous in each cell. *Capsule* short or elongate, always woody, 5- to 20-celled, septicidally dehiscent, the valves separating from the placentas from above downwards. *Seeds* numerous, ellipsoid, albuminous, the testa often crested or tailed at one end or at both. —Distrib. Species about 160, in mountainous parts of Europe, Asia, and North America.

Corolla widely campanulate, tubular only at the base :—

All parts glabrous, leaves not glaucous and without scales; capsule 1 to 1·5 in. long .. .. 1. *R. javanicum.*

Lower surfaces of leaves glaucous, the nerves and reticulations hairy; capsule ·5 in. long .. .. .. 2. *R. Wrayi.*

Corolla narrowly campanulate or funnel-shaped, the tube inflated upwards and passing gradually into the limb; flowers ·35 to ·85 in. long :—

Leaves obovate, ·6 to ·8 in., and rarely as much as 1 in. long :—

All parts glabrous except the inflorescence .. .. 3. *R. pauciflorum.*

All parts more or less scaly .. .. .. 4. *R. perakense.*

Leaves elliptic to elliptic-rotund, from 1·25 to 2 in. long .. 5. *R. Scortechinii.*

Corolla salver-shaped, the tube much longer than the limb :—

Tube of corolla from 1·25 to 1·6 in. long, and about ·15 in. in diam. from base to apex; leaves sub-sessile, whorled, sparsely scaly or glabrous .. .. 6. *R. jasminiflorum.*

Tube of corolla 2 in. long, ·25 in. wide near the base, widening to ·4 in. or more near the mouth; petioles ·35 to ·5 in. long 7. *R. longiflorum.*

Tube of corolla ·6 in. long and about ·2 in. in diam.; petioles ·4 to ·6 in. long .. .. 8. *R. malayanum.*

Species imperfectly known .. .. 9. *R. dubium.*

1. RHODODENDRON JAVANICUM, Benn. Pl. Jav. Rar. p. 85, t. 19. An epiphytic shrub, 3 to 8 feet long; all parts glabrous, esquamose; young branches rather thinner than a goose-quill. *Leaves* thinly coriaceous, elliptic or elliptic-oblong, tapering to the acute apex and base; both surfaces brown when dry (the lower rather the lighter), shining, the midrib very prominent; main-nerves about 8 or 10 pairs, interarching rather far from the edge, faint on the upper surface, obsolete on the lower, the intermediate nerves almost as prominent; length 3·5 to 5·5 in.; breadth 1·25 to 2 in.; petioles ·3 to ·75 in. long. *Umbels* terminal, 5- to 7-flowered, enveloped in bud in broadly ovate apiculate bracts; pedicels ·5 to 1·5 in.; bracteoles linear. *Calyx* cupular, less than ·1 in. deep, the mouth wavy. *Corolla* red, widely campanulate, 1·25 to 1·5 in. long; the tube widely funnel-shaped, cylindric at the base; the limb 1·25 to 1·5 in. wide, with 5 large, broad, blunt spreading lobes. *Stamens* 10, shorter than the corolla-limb; the filaments slender; the anthers oblong. *Ovary* glabrous or slightly scaly (hairy in var. *Teysmanni*); style shorter than the stamens, clavate, hemispheric. *Capsule* narrowly cylindric, 1 to 1·5 in. long, and only ·25 in. in diam., glabrous, slightly ridged, crowned by the whole or part of the style. DC. Prod. VII. 721; Bot. Mag. t. 4366; Fl. des Serres (1847), t. 293; Miq. Fl. Ind. Bat. II. 1057; Miq. in Ann. Mus. Lugd. Bat. I. 42, t. 1B; Clarke in Hook. f. Fl. Br. Ind. III. 463. *Vireya javanica*, Blume Bijdr. II. 854.

MALAY PENINSULA: *Lobb* and others. PENANG: *Ridley* 129.

Kedah: *Derry* 5531. Perak: *Scortechini* 373, 1325; *Derry* 3705; *Fox* 129; *King's Collector* 2335, 3672, 6916, 7008; *Wray* 1023. Singapore: *Ridley*.—Distrib. Sumatra, Java, Celebes.

Var. *Teysmanni*, King & Gamble. *Ovary* densely hairy; filaments hairy near the base, corolla yellow. *R. Teysmanni*, Miq. Fl. Ind. Bat. Suppl. 585; Clarke in Hook. f. Fl. Br. Ind. III. 463.

Penang: *Maingay* (K.D.) 1099, 10257; *Curtis* 530. Perak: *Wray* 601, 623; *King's Collector* 3672.—Distrib. Sumatra, Java.

2. Rhododendron Wrayi, n. sp., King & Gamble. A bush; young branches as thick as a goose-quill, at first sparsely scaly, ultimately glabrous. *Leaves* very coriaceous, elliptic or sub-obovate-elliptic, the apex sub-acute, the base rounded, the edges recurved when dry; upper surface dark-brown when dry, glabrous, the midrib much depressed; lower surface white, glaucous, with short hairs on the minute reticulations, the main-nerves, and the bold midrib; main-nerves 6 to 12 pairs, spreading, curved, rather dark-coloured and conspicuous on the lower surface, invisible on the upper; length 1·75 to 3·5 in.; breadth ·85 to 1·5 in.; petioles ·4 to ·8 in. long, stout, scaly. *Umbels* terminal, 8- to 12-flowered, unequal, ·5 to ·75 in. long, scaly. *Flower-buds* enveloped in obovate-oblong apiculate bracts, the inner tomentose externally, the outer glabrous, all deciduous. *Calyx* cupular, 5-toothed, less than ·1 in. deep. *Corolla* glabrous, white, tinged with pale pink and spotted in the throat, widely campanulate from a tubular base, about 1·25 in. long, and rather more in breadth at the mouth; lobes of the limb 5, broadly ovate, spreading. *Stamens* 10; filaments shorter than the corolla, glabrous; anthers oblong. *Ovary* hairy; style glabrous, longer than the stamens; stigma hemispheric, lobed. *Capsule* only ·5 in. long and about half as much in diam., not apiculate, tomentose, ridged, 5-celled.

Perak, at from 3,500 to 7,000 feet: *Wray* 322, 886, 1569; *Scortechini*.

3. Rhododendron pauciflorum, n. sp., King & Gamble. A small shrub, all parts except the inflorescence glabrous; young branches as thick as a crow-quill, smooth. *Leaves* coriaceous, obovate, rarely rotund-obovate, the apex broad, usually minutely retuse, the base much narrowed, the edges recurved; upper surface olivaceous, the lower brown when dry; the midrib stout and prominent on the lower surface, depressed on the upper (when dry); main-nerves 3 or 4 pairs, indistinct on both surfaces; length ·6 to 1 in.; breadth ·4 to ·65 in.; petioles less than ·1 in. long. *Flowers* 1 or 2, terminal; their pedicels pubescent, ·25 to ·6 in. long, with 1 or 2 loose sheathing deciduous bracts at their bases. *Calyx* cupular, about ·1 in. long, obscurely toothed. *Corolla*

bright red, infundibuliform-campanulate, ·2 to ·3 in. wide at the throat and from ·5 to ·85 in. long; the limb spreading, ·5 to ·75 in. across, divided into 5, broad, blunt lobes, the tube ·35 to ·5 in. long. *Capsule* unknown.

PERAK, on Gunong Batu Pateh at an elevation of 4,500 feet: *Wray* 231; *Scortechini* 345B.

4. RHODODENDRON PERAKENSE, n. sp., King & Gamble. Epiphytic; a small shrub with very scaly young branches as thick as a crow-quill. *Leaves* very coriaceous, obovate or broadly oblanceolate, obtuse, much narrowed to the base, the edges recurved; upper surface olivaceous when dry, at first with a few large scales but ultimately glabrous, reticulate, the midrib depressed; lower surface dark brown, with persistent large dark scales in pits, the midrib very thick and prominent; main-nerves 2 (rarely 3) pairs, spreading, very prominent on the under surface, and, like the midrib, with persistent large dark scales; length ·6 to ·8 in.; breadth ·3 to ·4 in.; petioles about ·1 in. long. *Umbels* terminal, 3- to 5-flowered, covered in bud by broad rounded deciduous bracts with ciliate edges; pedicels ·25 to ·3 in. long, slightly scaly. *Flowers* ·35 to ·4 in. long. *Calyx* shallow, cupular, its edges wavy. *Corolla* bright yellow, narrowly campanulate, the mouth with broad, slightly spreading lobes. *Stamens* not exserted; filaments glabrous, anthers short. *Ovary* sub-glabrous; style not exserted; stigma clavate, truncate. *Capsule* ·3 in. long, dehiscing by 5 straight untwisted valves.

PERAK, at an elevation of 7,000 feet: *Wray* 1574.

5. RHODODENDRON SCORTECHINII, n. sp., King & Gamble. Shrubby, epiphytic or terrestrial, when the latter sometimes sub-arboreous; young branches half as thick as a goose-quill, smooth, terete. *Leaves* very coriaceous, elliptic to elliptic-rotund or obovate, the apex obtuse and sometimes faintly notched, the base cuneate, the edges recurved; upper surface dark olivaceous-brown when dry, glabrous, shining, depressed-reticulate; lower surface of a uniform warm brown, not reticulate, pitted and minutely scaly; main-nerves 4 to 6 pairs, spreading, depressed on the upper surface, and raised on the lower (sometimes very much so); midrib much depressed on the upper surface and prominent on the lower (when dry); length 1·25 to 2 in.; breadth ·75 to 1·25 in.; petioles ·1 to ·15 in. long, scaly. *Umbels* terminal, 4- to 7-flowered; the pedicels unequal, ·5 to 1 in. long (longer in fruit). *Flowers* about ·75 in. long. *Calyx* short, cupular, with many rounded teeth. *Corolla* yellow (sometimes very pale), ·75 in. long, widely funnel-shaped, the mouth about ·6 in. across, with 5 deep, broadly ovate, slightly spreading lobes, the outer surface with many dark-

coloured scales. *Stamens* about 8, slightly or not at all exserted; filaments glabrous; anthers elliptic, small. *Ovary* scaly; *style* slightly exserted, glabrous; *stigma* clavate-hemispheric, lobed. *Capsule* ·5 in. long, scaly, shortly apiculate, 5-valved, the valves not twisted in dehiscence.

PERAK, at elevations of 5,000 to 7,000 feet: *Scortechini* 401B, 753; *Wray* 311, 1572, 3840; *Cantley*.

6. RHODODENDRON JASMINIFLORUM, Hook. Bot, Mag. t. 4524. Usually epiphytic; a small shrub, only a few feet high; young branches somewhat less than half as thick as a goose-quill, glabrous. *Leaves* in whorls, thickly coriaceous, almost sessile, broadly elliptic to elliptic-rotund, the apex acute, the base rounded and minutely cordate; upper surface when dry pale olivaceous-brown, sometimes with a few small loose scales, the 5 to 7 pairs of spreading main-nerves slightly distinct and (like the midrib) depressed; the lower darker brown, not olivaceous, the nerves very faint but the midrib pale and prominent; length 1·25 to 3 in.; breadth 1 to 1·5 in.; petiole ·1 in. long. *Umbels* terminal, 8- to 20-flowered; the pedicels filiform, ·75 to 1 in. long, scaly and hairy; bracteoles membranous, broad, glabrous, ·25 to ·5 in. long. *Calyx* a shallow toothed cup, less than ·1 in. deep. *Corolla* white, salver-shaped; the tube narrowly cylindric, sparsely scaly or glabrous outside, about ·15 in. in diam. and 1·25 to 1·6 in. long (when dry); the limb one-third as long, spreading, with 5 deep, broad, obovate-obtuse or rotund lobes. *Stamens* 10, the filaments shortly exserted, thin, pubescent; anthers short, broad. *Ovary* 5-celled, pubescent; style longer than the corolla-tube, pubescent; stigma depressed-capitate, grooved. *Capsule* about ·75 to 1 in. long, narrowly sub-cylindric, much apiculate, ridged, its valves recurved to the base and often twisted. Lemaire, Jard Fleur. t. 41; Illust. Hortic. (1859) t. 203; Clarke in Hook. f. Fl. Br. Ind. III. 463; Miq. Fl. Ind. Bat. II. 1059.

MALACCA, on Mount Ophir: *Griffith* (K.D.) 3504; *Maingay* (K.D.) 701; *Ridley*. PERAK: *Wray* 1635; *Scortechini*; *King's Collector* 3586, 3645, 6909; *Ridley* 124.—DISTRIB. Java, Sumatra.

7. RHODODENDRON LONGIFLORUM, Lindl. in Journ. Hort. Soc. III. 88 *with figure*. Epiphytic; 3 to 6 feet high; young branches half as thick as a goose-quill, densely scaly like the petioles. *Leaves* coriaceous, usually elliptic-oblong, sometimes elliptic or oblanceolate, sub-acute or acute, much narrowed to the base; upper surface when dry olivaceous-brown, coarsely and widely reticulate with broad black scales, especially on the depressed midrib, the 5 to 7 pairs of spreading main-nerves faint; lower surface brown, uniformly covered with black deciduous scales, ultimately glabrous; the main-nerves indistinct but the midrib

stout and prominent; length 2·25 to 3·5 in.; breadth ·8 to 1·5 in.; petioles ·35 to ·5 in. long, stout. *Umbels* terminal, 5- to 7-flowered; flower-pedicels ·5 to ·8 in. long, scaly or glabrous. *Flowers* about 2 in. long, glabrous outside, narrowly sub-campanulate, almost salver-shaped. *Calyx* small, cupular, with wavy edges, under ·05 in. deep. *Corolla* red, infundibuliform; its tube about ·25 in. wide near the base but expanding gradually to about ·4 in. or more near the mouth, about three times as long as the broadly bluntly 5-lobed limb. *Stamens* 10, the filaments slender, pubescent, slightly exserted; anthers short, blunt. *Ovary* densely hairy like the style; stigma clavate. *Capsule* unknown. Fl. des Serres, V. p. 477–480F.

PERAK: *Scortechini* 385, 553, 1409; *King's Collector* 1864, 5181.—DISTRIB. Borneo, Sumatra.

8. RHODODENDRON MALAYANUM, Jack in Mal. Misc. II. n. 7, 17. An erect straggling shrub, 3 to 15 feet high, all parts more or less glandular and scaly; young branches less than half as thick as a goose-quill. *Leaves* narrowly elliptic or lanceolate, the apex and base acute or sub-acute, the edges recurved when dry; upper surface shining, glabrous, and olivaceous when dry, the 5 to 8 pairs of main-nerves faint, slightly depressed, the midrib much depressed and often scaly; the lower of a deep uniform brownish-cinereous colour and with numerous dark scales, the nerves obsolete but the midrib bold and prominent; length 1·75 to 3·25 in.; breadth ·75 to 1·25 in.; petioles ·4 to ·6 in. long, covered with large black scales. *Umbels* terminal, 3- to 5-flowered. *Flowers* ·8 in. long, their pedicels ·25 to ·35 in. long, slender, scaly. *Calyx* cupular, 5-toothed, less than ·05 in. deep. *Corolla* red, glabrous, ·8 in. long (when dry), salver-shaped, the tube about ·2 in. in diam. when dry, about ·6 in. long, the limb about ·5 in. across when dry, with 5 broad, blunt, cuneate lobes. *Stamens* 10, their filaments glabrous. *Ovary* 5-celled; style slightly exserted from the throat of the corolla, glabrous; stigma clavate. *Capsule* about 1 in. long, slender, ridged, the valves much recurved, twisted. Hook. Journ. Bot. I. 369; DC. Prod. VII. 725; Bot. Mag. t. 6045; Beccari Malesia, I. 205; Clarke in Hook. f. Fl. Br. Ind. III. 463. *R. tubiflorum* and *R. celebicum*, DC. l.c. 725; Miq. in Ann. Mus. Lugd. Bat. I. 44, t. 2AB; Fl. Ind. Bat. II. 1059. *R. lampongum*, Miq. Fl. Ind. Bat. Suppl. 585. *Vireya tubiflora* and *V. celebica*, Blume Bijdr. 855, 854.

MALACCA: on Mount Ophir, 4,000 ft., *Griffith* (K.D.) 3503; *Maingay* (K.D.) 702; *Wray*; *Kurz*. PERAK: *Scortechini* 385, 2336; *Wray* 614; *King's Collector* 3227, 8076. PENANG: *Ridley* 125. SELANGOR: *Ridley* 7557.—DISTRIB. Sumatra, Java.

9. RHODODENDRON DUBIUM, n. sp., King & Gamble. A shrub or small

tree; young branches rather thinner than a goose-quill, pale brown when dry, slightly pubescent. *Leaves* coriaceous, glabrous, oblong-elliptic, the apex sub-acute, narrowed from about the middle to the acute or rounded base; both surfaces dull brown when dry and minutely reticulate, the lower pale; main-nerves 15 to 18 pairs, slightly curved, spreading, indistinct on the upper surface, rather distinct on the lower; the midrib very bold and prominent on the lower surface, faint and depressed on the upper; length 3·5 to 6 in.; breadth 1 to 2 in.; petiole ·75 to 1 in. long, stout. *Umbels* shortly stalked, 3- to 8-flowered; flower-pedicels unequal, ·75 to 1·35 in. long, stout, glabrous. *Flowers* unknown. *Calyx* cupular, ·1 in. deep, the mouth wavy. *Ovary* densely rufescent-pubescent. *Capsule* ·4 to ·7 in. long, rusty-pubescent, very slightly ridged, dehiscing by 5 straight valves, crowned by the persistent pubescent style.

PERAK, at an elevation of 3,400 feet: *Wray* 233, 460: *Scortechini* 367.

5. PERNETTYOPSIS, King & Gamble, nov. gen.

Small rigid epiphytic shrubs. *Leaves* alternate, on short hispid petioles, minutely sub-crenulate, coriaceous, persistent. *Flowers* solitary or in pairs, axillary, with 2 (rarely 3) rather large bracts at their bases forming an involucre; pedicels decurved in fruit. *Calyx* larger than the corolla, rotate, deeply 5-partite, persistent and unchanged in fruit. *Corolla* urceolate or ovoid, glabrous, the mouth constricted and with 5 short reflexed teeth. *Stamens* 10, free, included, the filaments slightly attached by their somewhat dilated bases to the bottom of the corolla-tube. *Anthers* short, inappendiculate at the back or base, oblong, the apices prolonged into 2 long porously dehiscing tubes. *Ovary* faintly 5-lobed, 5-celled; style columnar; stigma simple; ovules numerous, the placentas on the inner angles of the loculi. *Berry* globose, 5-celled. *Seeds* minute, compressed, numerous, angled; testa crustaceous.—DISTRIB. Species 2, both Malayan.

Calyx densely rusty-tomentose .. .. 1. *P. malayana.*
Calyx glabrous except the tips of the lobes .. .. .. 2. *P. sub-glabra.*

1. PERNETTYOPSIS MALAYANA, n. sp., King & Gamble. Epiphytic; a bush a foot or two in height; young branches half as thick as a goose-quill, sparsely clothed near their apices with flat adpressed black bristles less than ·1 in. long. *Leaves* thickly coriaceous, rotund, obovate to elliptic, the apex broad, minutely apiculate, the base slightly narrowed; upper surface olivaceous-brown when dry, shining, the midrib and main-nerves deeply depressed, the reticulations less so; lower

surface pale dull-brown, with sparse pits, each bearing a short adpressed dark hair, the edges wavy, sub-serrate and adpressed-ciliate; main-nerves 2 or 3 pairs, curving upwards and inwards and interarching, thick but faint on the lower surface; length 1·25 to 2 in.; breadth ·75 to 1·35 in.; petioles ·1 to ·2 in., adpressed-bristly. *Flowers* solitary or in pairs, ·4 or ·5 in. long, axillary, pedicellate, the pedicels ·3 to ·4 in. long, twice as long (or more) in fruit, densely rusty-tomentose and recurved when young, erect and less woolly when old. *Involucral bracts* usually 2, thick, about ·2 in. long, broad, glabrous inside, rusty-tomentose outside. *Calyx* larger than corolla, rotate, deeply divided into 5 lanceolate, somewhat spreading, lobes; rusty-tomentose outside and sub-glabrous inside. *Corolla* a little shorter than the calyx, glabrous, ovoid-globular, its mouth contracted and with 5 short reflexed teeth. *Stamens* 10, shorter than the corolla, and inserted near its base; *anthers* oblong, broad, cordate and inappendiculate at the base; the apex prolonged into 2 white apically porous tubes; filaments short, bent. *Ovary* sub-globular, laxly and deciduously tomentose, 5-celled; ovules numerous, oblong-concave, attached by the middle to the axillary placentas; style cylindric, slightly grooved, twice as long as the corolla. *Fruit* a berry with scanty pulp, blue when ripe, the seeds red.

PERAK, at elevations of about 6,500 feet, on the summit of Gunong Batu Pateh: *Scortechini* 402; *Wray* 312.

2. PERNETTYOPSIS SUB-GLABRA, n. sp., King & Gamble. A small, rigid, epiphytic shrub; young stems slightly thicker than a crow-quill, with a few adpressed bristles near the ends, otherwise glabrous. *Leaves* coriaceous, sub-rotund to elliptic-rotund, minutely apiculate; upper surface dull-brown, minutely reticulate, glabrous, the lower reddish-brown, with a few small adpressed hairs with black bases; main-nerves 3 or 4 pairs, curving upwards, deeply depressed on the upper surface like the midrib, less so on the lower; the edges minutely sub-serrate and sparsely adpressed-ciliate; length ·8 to 1·5 in.; breadth ·75 to 1·25 in.; petiole ·15 to ·25 in. long, adpressed-bristly. *Bracts* under the flower 2 or 3, broad, rusty-pubescent externally like the pedicel. *Calyx* longer than the corolla, rotate, with 5 deep lanceolate spreading lobes, glabrous except the rusty-pubescent tips. *Corolla*, stamens, ovary, and style as in *P. malayana*. *Fruit* unknown.

PERAK, at elevations of 5,000 feet: *Scortechini* 752; *King's Collector* 7407.

Order LXVII. MONOTROPEÆ.

[By D. PRAIN.]

Leafless, erect, white or coloured root-parasites; stems herbaceous, scaly, simple or forked. *Flowers* solitary on the stem or branches, regular, hermaphrodite. *Sepals* usually resembling the scales, 2 to 6, often deciduous. *Petals* 3 to 6. *Stamens* 6 to 12, hypogynous, 2-seriate; filaments filiform or flattened; anthers 2-celled, or by confluence 1-celled. *Ovary* superior, globose or fusiform, 1- to 6-celled; style cylindric, stigma peltate; ovules very many on axial or parietal placentas. *Fruit* capsular, loculicidally 4- to 6-valved, or indehiscent and baccate. *Seeds* very many, minute; testa often loosely saccate; embryo very minute, solid.—DISTRIB. Genera 9, in dense woods, mostly in temperate regions, all in the northern hemisphere.

1. CHEILOTHECA, Hook. fil.

Small herbs, with erect, simple or forked, white or coloured stems; branches 1-flowered. *Sepals* 3 to 5, narrowly oblong like the uppermost stem-scales. *Petals* 3, erect, obtuse. *Stamens* 6; anthers linear, cells 2, confluent at the apex, dehiscing by marginal slits or pores. *Ovary* fusiform, 1-celled, narrowed into the cylindric style; stigma globose-conic, usually slightly lobed; placentas 6, parietal, 2-fid, the segments covered throughout by numerous ovules. *Fruit* fleshy, indehiscent, baccate.—DISTRIB. Species 2, Indo-Chinese and Malayan.

1. CHEILOTHECA MALAYANA, Scort. in Hook. fil. Icon. Plant., XVI. t. 1564. A root-parasite in dense forest; stem herbaceous, erect, simple or 2- to 3-forked, 6 to 9 in. high, stoutish. *Scales* ovate-oblong, obtuse, imbricated, gradually increasing upwards, lurid purple (*Scortechini*) or waxy white (*Kunstler*). *Flowers* terminal on stem and branches, 1 in. long, hidden inside the uppermost scales, and bright yellow (*Kunstler*), or with the tips of the petals exserted and white (*Scortechini*). *Sepals* 5, resembling the uppermost scales, imbricate, linear-oblong, obtuse or sub-acute, glabrous. *Petals* 3, rather larger than the sepals, rounded-cucullate at the apex, externally glabrous, internally more or less pilose. *Stamens* 6, filaments puberulous or pilose, alternately somewhat shorter and longer; anthers short, innate, hippocrepiform, cells confluent at apex, dehiscing by marginal pores. *Ovary* narrowly fusiform; stigma obscurely 4-lobed; placentas 6, parietal. *Fruit* white, fleshy, baccate, ·75 in. across, tipped by the persistent remains of the stout style. Prain in Journ. As. Soc. Beng. LXXIII. 2, 205.

PERAK, in heavy jungle at about 3,500 feet elevation: *Scortechini*; *Kunstler* 2715.

According to the field notes recorded by these two careful collectors the specimens gathered by Kunstler differ from those obtained by Scortechini; in the latter the scales were lurid purple and the flowers were white, in the former the scales were waxy white and the flowers bright yellow. The petals in Kunstler's plant are sparingly hirsute within and the anthers are nearly twice as long. In other respects, however, the two plants are identical, and the doubt that one feels in connection with the two is not so much as to whether they are conspecific, as it is as to whether this Malayan *Cheilotheca* be really specifically separable from the species from the Khasia Hills upon which Hooker originally based the very distinct genus *Cheilotheca*. The only very tangible differences are that in the Khasia plant only 3 to 4 scales can be with propriety considered sepals, whereas in the Malayan one the number of sepals, as apart from the upper scales or bracts, is 5; and that in the Khasia plant the anthers are long, like linear lips on each side of the connective, whereas in the Malayan plant the anthers are much shorter and distinctly hippocrepiform. The fruit appears to be quite indehiscent, and thus deviates from the fruit in other genera of *Monotropeæ*, which, so far as is known, is always loculicidally dehiscent.

Order LXVIII. EPACRIDEÆ.

Shrubs or small trees. *Leaves* alternate, rarely sub-opposite or pseudo-verticillate, articulated with the branches, sometimes fascicled or imbricate, coriaceous or rigid, persistent, entire, with parallel longitudinal nerves; ex-stipulate. *Flowers* hermaphrodite, solitary and axillary or terminal, spicate or racemose, generally white or red; usually bracteate and usually 2-bracteolate; the bracteoles similar to the sepals. *Calyx* 4- to 5-partite, the segments coriaceous, striate, imbricate, persistent. *Corolla* 4- to 5-fid, monopetalous, deciduous or sometimes marcescent; the tube short or long, often cylindric or funnel-shaped; the lobes short or long, erect, patent or recurved, imbricate or valvate, persistent. *Stamens* 5, rarely 4, hypogynous or epipetalous, the filaments short or long, filiform or flattened, free; the anthers dorsifixed, oblong, dehiscing along their whole length by a single slit, 1-celled or spuriously 2-celled. *Disk* cupular, annular or of simple or bifid scales equal in number to the carpels. *Ovary* globose or ovoid, 1- to 10-celled; style terminal, short or long, filiform; stigmas punctiform, discoid or lobulate, sometimes annular or indusiate; ovules in each cell solitary, pendulous, rarely erect; or many on a central placenta. *Fruit* drupaceous, with 2 to 5 1-seeded pyrenes; or a many-seeded capsule. *Seeds* small, with fleshy albumen, testa membranaceous; embryo axile, orthotropous, smooth; cotyledons short; radicle elongate, near the hilum.—DISTRIB. About 320 species, nearly all Australian, a few in

New Caledonia and New Zealand, the Pacific Islands, or the Malay Archipelago.

LEUCOPOGON, Br.

Shrubs, erect or prostrate, branching, rarely trees. *Leaves* various, sessile or petiolate, striate-nerved. *Flowers* small, white, in axillary or terminal spikes or racemes, the rachis ending in an imperfect flower; bract 1, bracteoles 2 to 3 under the calyx. *Calyx* 5-partite. *Corolla*-tube funnel-shaped or campanulate; lobes 5, valvate in bud, patent or upper part recurved, hairy within. *Stamens* fixed to the top of the corolla-tube, filaments short, filiform; anthers dorsifixed, included or semi-exsert, linear or oblong. *Ovary* 2- to 5-celled; style short or elongated, terminal; stigma sub-capitate; ovules solitary in each cell, pendulous. *Fruit* drupaceous, with a crustaceous or bony endocarp, 1- to 5-celled, cells 1-seeded. *Seeds* small.—DISTRIB. About 130 species, all but about 20 Australian, the rest in New Zealand, the Pacific Islands, and the Malay Archipelago.

LEUCOPOGON MALAYANUS, Jack in Mal. Misc. I. v. 20, and Hook. Bot. Misc. II. 71. A small branching shrub, reaching 3 to 6 feet in height; branches grey, marked by the scars of fallen leaves, branchlets very leafy; branch-buds elongate, supported by imbricate parallel-veined ciliate deciduous scales. *Leaves* alternate, sessile, stiff, entire, narrowly lanceolate, acute and mucronate at apex, 1·5 to 2·5 in. long, ·3 to ·5 in. broad, shining and convex above, dull or glaucous beneath, ciliate when young; midrib none, nerves very close, slender, longitudinally parallel, in old leaves scarcely visible. *Flowers* in short axillary 3- to 7-flowered spikes, ·5 in. long, the last flower imperfect; rachis villous, sometimes flexuose; bracts ovate, recurved, bracteoles 2, ovate, acute, ciliate, closely embracing the calyx. *Calyx*-lobes 5, crustaceous, elliptic-oblong, ·125 in. long, ciliate. *Corolla* campanulate, ·1 to ·2 in. long; lobes 5, ·1 to ·15 in. long, spreading, villous within. *Hypogynous scales* 5, minute, free, obtuse. *Stamens* 5, short, alternate with the corolla-lobes; filaments inserted near the top of the anthers; anthers curved, pendent, opening longitudinally; pollen globose. *Ovary* 5-celled; ovule 1 in each cell, oblong; style erect, ·05 in. long, villous; stigma sub-globose. *Fruit* a 5-celled baccate drupe, ·1 to ·2 in. in diam., each cell 1-seeded. *Seeds* not seen. Wall. Cat. 3720; Wall. in Roxb. Fl. Ind., ed. Carey and Wall. II. 301; G. Don Gen. Syst. III. 777; DC. Prod. VII. 744; Miq. Fl. Ind. Bat. II. 1052; Kurz in Journ. As. Soc. Beng. XLVI. ii. 217, and For. Fl. II. 95; Clarke in Hook. f. Fl. Br. Ind. III. 477. *Styphelia malayica*, Spreng. Syst. IV. Cur. post, 67.

PERAK: *Scortechini* 760; *Cantley* 46; *King's Collector* 7428, 8056.

MALACCA: *Jack*; *Griffith* (K.D.) 3453/1; *Maingay* (K.D.) 704; *Lobb*; on Mount Ophir, *Moxon*; *Ridley*. SINGAPORE: *Jack*; *Sir R. Schomburgk* 50; *Wallich* 3720; *Ridley* 1832.—DISTRIB. Bangka, *Teysmann*; Borneo, *Ridley*.

VAR. *moluccana*, Kurz in Journ. As. Soc. Beng. XLVI. ii. 217, and For. Fl. II. 96. *Leaves* ·5 to 1 in. long, subulate-pointed, venation more prominent, branchlets more slender. *L. moluccanum*, Scheff. Obs. Phyt. III. 97.

KEDAH peak: *Low*.—DISTRIB. Tenasserim, *Helfer* (K.D.) 3453.

Order LXIX. PLUMBAGINEÆ.

Herbs or undershrubs. *Leaves* various, alternate or fascicled. *Flowers* in terminal scapes or branches, capitate, spicate, racemed or panicled; bracts scarious or leafy, often sheathing the flower, bracteoles 2. *Calyx* inferior, gamosepalous, tubular or funnel-shaped, 5- to 10-ribbed, often hyaline between the ribs; lobes 5, usually scarious. *Corolla* hypogynous; petals 5, free or connate at the base or united in a linear tube; lobes spreading. *Stamens* 5, opposite the petals; filaments free or adnate in a tube with the corolla; anthers ovate or oblong, dorsifixed, cells parallel, dehiscing longitudinally. *Ovary* superior, sessile or very shortly stalked, 1-celled, 5-angular above; styles 5, distinct from the base or connate below; stigmas sub-capitate; ovule 1, pendulous from a basal ascending funicle, anatropous. *Fruit* included in the calyx or elongate or exsert, dry or indehiscent, membranous or hardened at the apex, circumsciss or breaking near the thin base, the apex often 5-valved. *Seeds* cylindric or elongate, pendulous, albumen copious or little or 0, radicle superior; embryo straight, cotyledons linear or oblong.—DISTRIB. Species about 200, mostly of sea-coasts or desert places throughout the world.

Large shrubs with broad-petioled leaves; styles 5, distinct; stamens united in a tube with the corolla	1. ÆGIALITIS.
Perennial herbs with auriculate leaves; style 1, filiform, with 5 stigmatic branches; stamens free	2. PLUMBAGO.

1. ÆGIALITIS, R. Br.

Simple-stemmed, soft-wooded shrubs. *Leaves* orbicular, alternate, coriaceous, glabrous, entire, smooth, gland-dotted, reticulately-veined, with long, thick, winged, amplexicaul petioles. *Flowers* in axillary or terminal panicles of racemes; bract 1, sheathing, coriaceous, obtuse; enclosing the 2 bracteoles. *Calyx* tubular, folded; lobes 5, short, induplicate-valvate. *Corolla* usually shorter than calyx, lobes 5, slightly cohering at base. *Stamens* adhering to the base of the petals. *Ovary* 1-celled; styles free, stigmas capitate. *Fruit* a capsule, linear, long-exserted from the calyx, pentagonal, 1-seeded.—DISTRIB. Species 2, one Indian the other Australian.

ÆGIALITIS ROTUNDIFOLIA, Roxb. Fl. Ind. II. 111. A simple-stemmed, soft-wooded shrub, 3 to 8 feet high; stem about 3 in. in diam., conical in shape. *Leaves* alternate, orbicular, very slightly acute at apex, rounded or slightly cordate at base, diam. 2 to 3 in., entire, glabrous, coriaceous, minutely glandular-dotted, shining above, dull beneath; midrib thick and prominent, veins at an angle of 60 degrees with the midrib, closely reticulate; petiole very stout, 2 to 3 in. long, prominently winged, the wings sheathing, amplexicaul, leaving annular scars when they fall. *Inflorescence* of axillary or terminal panicled racemes; flowers pale yellow, nearly sessile, enclosed in sheathing bracts; bract 1, ·3 to ·4 in. long, concave, obtuse, enclosing the two similar but smaller bracteoles. *Calyx* cylindric, furrowed, ·2 to ·3 in. long; teeth 5, short. *Corolla* slightly longer than calyx; lobes 5, narrow. *Stamens* inserted on the base of the corolla; filaments shorter than corolla-tube; anthers linear-oblong. *Ovary* 1-celled, styles free, stigma capitate, ovule 1 pendulous. Wall. Cat. 7240; Griff. Notul. IV. 207; Clarke in Hook. f. Fl. Br. Ind. III. 479; Prain Beng. Plants I. 638. *Æ. annulata* var. *rotundifolia*, DC. Prod. XII. 621. *Æ. annulata*, Kurz in Journ. As. Soc. Beng. XLVI. ii. 217; For. Fl. II. 96 (*not of R. Br.*). *Ægianilites rotundifolia*, Presl. Bot. Bemerk. 103.

MALACCA: *Griffith* (K.D.) 4156.—DISTRIB. Coasts of Bengal and Burma and the Andaman Islands, in mangrove swamps.

2. PLUMBAGO, Linn.

Perennial herbs or undershrubs, rarely annual, branches usually straggling or sub-scandent. *Leaves*, if present, alternate, entire, the petioles usually amplexicaul, auriculate at base. *Flowers* in terminal spikes or spicate racemes, forming sometimes a leafy terminal panicle; bract 1, bracteoles 2, usually small. *Calyx* tubular, glandular, 5-fid, the teeth erect. *Corolla* funnel-shaped; tube slender, lobes spreading. *Stamens* free; filaments filiform, inserted on hypogynous glands; anthers oblong, dorsifixed, usually exsert. *Ovary* attenuate at apex; style slender, divided into stigmatose branches; ovule 1, pendulous from a basal ascending funicle. *Fruit* a capsule, included in the persistent calyx and corolla, circumsciss near the base, hardened above; seed solitary, albumen very small, embryo slender, radicle superior, cotyledons oblong.—DISTRIB. About 10 species, found in the warm regions of both hemispheres.

PLUMBAGO ZEYLANICA, Linn. Sp. Pl. (1753) 151. A straggling perennial herb; branches rounded, striate, glabrous. *Leaves* alternate, ovate, shortly acute at apex, rounded at base and suddenly narrowed and decurrent, 2 to 5 in. long, 1 to 2·5 in. broad, entire, thin, glabrous above, somewhat scurfy beneath and often glaucous; midrib slender, prominent beneath, main-nerves 6 to 7 pairs, also prominent, curving upwards, secondary nerves and reticulations obscure; petiole ·5 to 1 in. long, winged by the gradually narrowing decurrent base of the blade, auricled and amplexicaul at base. *Inflorescence* a terminal leafy panicle of spicate racemes, the rachis densely glandular; bract ovate, acuminate, bracteoles 2, linear-subulate; pedicels very short or none, bracts and pedicels glandular. *Calyx* narrowly tubular, about ·5 in. long, more or less deeply 5-fid; lobes slender, hyaline on the margins, covered thickly on the back with prominent stalked red glands. *Corolla*-tube white, slender, funnel-shaped, membranous, about 1 in. long; lobes 5, nearly ·5 in. long, ovate, acute, patent. *Stamens* 5, free; filaments very slender; anthers oblong, dorsifixed, exsert. *Ovary* ovoid; style filiform, dividing into 5 stigmatose branches. *Capsule* membranous below, thick above, 5-furrowed, sharply pointed; seed pendulous, oblong; cotyledons obtuse. DC. Prod. XII. 692; Roxb. Hort. Beng. 13, Fl. Ind. I. 462; Wall. Cat. 7241G; Wight Ill. t. 179; Miq. Fl. Ind. Bat. II. 994; Dalz. and Gibs. Bomb. Fl. 220; Kurz in Journ. As. Soc. Beng. XLVI. ii. 217; Clarke in Hook. f. Fl. Br. Ind. III. 480; Trimen Fl. Ceyl. III. 65; Prain Beng. Plants I. 639. *P. auriculata*, Bl. Bijdr. 736. *P. viscosa*, Blanco Fl. Filip. ed. I. 78. 'Tumbacodivéli,' Rheede Hort. Mal. X. t. 8.

PENANG: *Curtis* 93; *Deschamps*. NEGRI SEMBILAN: *Ridley* 10095. SINGAPORE: *Deschamps*; *King's Collector* 284.—DISTRIB. Tropical regions of the Old World, doubtfully indigenous in the Malay Peninsula or elsewhere.

Order LXXVIII. GENTIANACEÆ.

[By C. B. CLARKE.]

Herbs, erect, twining, or floating; glabrous except *Microrphium*. *Leaves* entire; those of the lower main stem opposite except in the floating plants. *Inflorescence* in 2- to 3-divided cymes, or peduncles 1-flowered. *Flowers* symmetric in calyx, corolla, stamens (except in *Canscora*). *Calyx* tubular or campanulate; lobes 4 to 5 (or by accident (?) 6), oblong or linear. *Corolla* gamopetalous, tube long or short; lobes as many as calyx-segments, usually dextrorsely contorted in the bud. *Stamens* as many as the corolla-segments, all perfect (except in

Canscora); filaments on the corolla-tube; anthers of 2 parallel cells. *Ovary* 1- (or imperfectly 2-) celled; of 2 carpels, superior or stalked or slightly inferior; style linear or oblong; stigma capitate or shortly 2-lobed; placentas parietal, sometimes much intruded, partly coalescing in the axis; ovules very many. *Capsule* dehiscent or indehiscent, not rarely becoming more or less succulent; seeds many, albuminous. —Distrib. Species 700; found in all countries.

Erect herbs; lower stem leaves (often all the leaves) opposite:—	
Glabrous; corolla blue	1. Exacum.
Pubescent all over	2. Microrphium.
Glabrous; corolla rose-coloured or white	3. Canscora.
Twiner; corolla narrow, more than 1 in. long	4. Crawfurdia.
Floating (or creeping on mud); leaves round-ovate:—	
Peduncles solitary, from the axil of a long-petioled leaf ..	5. Villarsia.
Peduncles clustered, from the axil of a sessile leaf.. ..	6. Limnanthemum.

1. Exacum, Linn.

Glabrous erect herbs. *Leaves* opposite, usually 3- to 5-nerved. *Flowers* panicled, 4- to 5-merous. *Calyx* deeply lobed. *Corolla* rotate; tube globose; lobes ovate or oblong, blue or white. *Stamens* attached in the corolla throat; anthers large, of two oblong cells, which open first by terminal pores or short slits. *Ovary* more or less completely 2-celled; style linear; stigma sub-capitate. *Capsule* globose, septicidally 2-valved; seeds numerous, minute, cuboid.—Distrib. Species 30, whereof 20 Indian, the others in China, Malaya, Africa.

Stem 1 to 4 feet; corolla-lobes ½ in. long, azure blue ..	1. *E. tetragonum.*
Stem 4 to 12 in.; corolla-lobes ¼ to ⅓ in. long, pale blue ..	2. *E. pedunculatum.*

1. Exacum tetragonum, var. β *stylosa*, C. B. Clarke in Hook. fil. Fl. Br. Ind. IV. 95. *Stem* 1 to 4 feet, quadrangular. *Leaves* 5 by 1 in., sessile, lanceolate, 3- to 5-nerved. *Panicle* many-flowered; bracts at its divisions ·25 to ·5 in. long, linear; flowers 4-merous, or rarely 5-merous. *Calyx-lobes* ·25 in. long, ovate acuminate. *Corolla-lobes* ·5 in. long, broadly elliptic acute, full azure-blue. *Anthers* ·2 in. long, straight. *Style* ·5 in. long. *Capsule* globose, ·25 in. in diam. *E. stylosum* (sp.), Griseb. in DC. Prod. IX. 46. *E. chironioides*, Griseb. Gent. 109, in DC. Prod. IX. 45. *E. Horsfieldianum*, Miq. Fl. Ind. Bat. II. 556. *E. sulcatum*, C. B. Clarke in Journ. Linn. Soc. XIV. 425 (*not of Roxb.*). *E. tetragonum*, Vidal Fl. Filip. 191.

Singapore: *Lobb* 473.—Distrib. From Burma to Borneo and the Philippines.

2. Exacum pedunculatum, Linn. Sp. Pl. ed. I. 112; ed. II. 163.

Stem 4 to 12 in., quadrangular, often much-branched. *Leaves* 1·5 by ·5 in., sub-sessile, elliptic or lanceolate, 3-nerved. *Panicle* usually compound, many-flowered; lower bracts similar to the leaves, by degrees smaller, to the upper less than ·25 in. long; flowers 4-merous. *Calyx-lobes* ·17 to ·2 in. long, ovate, acute, winged. *Corolla-lobes* ·25 to ·35 in. long, pale blue. *Anthers* ·12 in. long, dehiscing finally half-way down. *Capsule* globose, ·17 in. in diam. DC. Prod. IX. 46; Hook. fil. Fl. Br. Ind. IV. 97; Trimen, Fl. Ceyl. III. 182. *E. pedunculare*, Arn. in Ann. Sc. Nat. ser. 2, XI. 176; Wight Ic. t. 336. *E. sulcatum*, Roxb. Fl. Ind. ed. Carey & Wall. I. 415; DC. Prod. IX. 46 (*syn. excl.*).

Singapore: *Lobb* 358.—Distrib. From Oudh and Bengal to Ceylon and Pegu.

2. Microrphium, C. B. Clarke, gen. nov.

A pubescent erect herb, repeatedly branched. *Leaves* alternate except a few distant opposite pairs on the main stem. *Flowers* numerous, solitary, pedicelled, in unilateral repeatedly branched cymes. *Calyx* short-cylindric, terete, sub-2-lipped, almost leathery; lobes 5, short. *Corolla* small; tube campanulate, lobes 5, equal, dextrorsely contorted in the bud. *Stamens* 5, equal, perfect; anthers exsert, cells oblong, parallel, dehiscing by a slit their whole length. *Ovary* 1-celled; placentas intruded; style linear, stigma sub-capitate. *Seeds* very small, ovoid, not angular.—Distrib. Species 1, Malayan.

1. Microrphium pubescens, C. B. Clarke, sp. nov. *Stem*, leaves, inflorescence, calyx covered with a short thick grey pubescence. *Stem* (upper part seen) 14 in. long; the lower part with opposite pairs of leaves (and branches) 2·5 in. apart; all the other numerous stem-divisions and leaves alternate. *Leaves* of the main stem ·75 by ·35 in., elliptic, entire, obtuse, narrowed at base; petiole 0 to ·1 in. long; the other leaves similar but smaller. *Pedicels* ·25 in. long. *Calyx* ·2 in. long; opening at first in two lips, one emarginate 2-nerved, the other ovate 3-nerved. *Corolla-tube* broad, lobes short, round, soon reflexed over the calyx-margin. *Capsule* ovoid, ·2 in. long, dry; seeds 200 μ in diam. *Pollen* globose; 25 μ in diam.

Kedah: *Curtis* 2528. "Height 1 to 2 feet; petals white; anthers yellow" (*Curtis*).

3. Canscora, Lam.

Herbs, dichotomously branched, glabrous or very nearly so. *Leaves* opposite. *Flowers* mostly cymose. *Calyx* large, membranous, tubular, often winged; teeth much shorter than the tube. *Corolla-tube* cylindric; lobes 4, unequal (except in *C. pentanthera*). *Ovary* 1-celled;

placentas intruded; style linear, lobes 2, hemispheric. *Capsule* 2-valved or breaking up irregularly. *Seeds* very small, polyhedral.—DISTRIB. Species about 25, extending from Africa through South-east Asia to Australia.

One stamen only perfect; corolla irregular .. .. 1. *C. diffusa.*
All stamens perfect; corolla regular .. .. .. 2. *C. pentanthera.*

Sub-genus 1. EU-CANSCORA. Calyx 4-toothed. Corolla sub-bilabiate. Stamens 4; 1 larger perfect, 3 shorter smaller or obsolete.

1. CANSCORA DIFFUSA, R. Brown, Prodr. (1810) 451 in Obs. Erect annual, 4 to 20 in., much branched upwards. *Leaves* 1·5 by ·5 in., lanceolate or elliptic, 3-nerved, often petioled, upper smaller. *Cyme* diffuse; lower bracts at its divisions ·5 in. long, ovate, upper much smaller. *Calyx* $\frac{1}{5}$ in. long; teeth lanceolate-linear. *Corolla* rose-coloured; tube $\frac{1}{5}$ in., lobes $\frac{1}{6}$ in. *Capsule* oblong, as long as the calyx. DC. Prod. IX. 64; Benth. Fl. Austral. IV. 372; Hook. fil. Fl. Br. Ind. IV. 103; Trimen Fl. Ceyl., III. 184. *Exacum diffusum*, Willd. Sp. Pl. I. 637. *Orthostemon erectum*, R. Br. Prod. 451; DC. l.c. 63. *O. Hugelii*, DC. l.c. 63. *Pladera virgata*, Roxb. Fl. Ind. ed. Carey & Wall. I. 417; Hook. Bot. Misc. III. 88 t. 25.

SINGAPORE: *Lobb* 345. A common species, extending from East Tropical Africa throughout India to Australia and the Philippines.

Sub-genus 2. PENTANTHERA. Stamens 5 (or 6), equal, anthers all similar, perfect. Corolla-lobes 5 (or sometimes 6), equal, dextrorsely contorted in the bud.

2. CANSCORA PENTANTHERA, C. B. Clarke, sp. nov. A slender undershrub, 18 in. high, glabrous except the minutely gland-puberulous (young) petioles; stem terete with many opposite branches. *Leaves* opposite, 3 by 1 in., ovate-lanceolate, acuminate, attenuate at the base; petiole 0 to ·2 in. *Cymes* loosely, repeatedly dichotomous, often carrying 10 flowers; bracts at the divisions similar to the leaves, but gradually smaller, becoming sessile, a few pairs connate into perfoliate bracts. *Flowers* solitary, ·5 in. long, on pedicels ·12 to ·5 in. long. *Calyx* ·35 in. long, membranous; tube triquetrous, narrowly 3-winged, ovoid-cylindric; lobes less than one-third the length of the tube, ovate, imbricate, apiculate. *Corolla* white (*Ridley*); tube as long as the calyx, lobes 5 (or not rarely 6), oblong-elliptic, equal, sub-erect, contorted dextrorsely (*sensu Linneano*) in the bud. *Stamens* 5 (or 6 in the 6-lobed corolla), equal, perfect; filaments inserted in the upper part of the corolla-tube from which the erect anthers are half-exsert; anther-cells 2, oblong or linear-oblong, opening by longitudinal slits; pollen 25 by 20 μ, ellipsoid, irregularly longitudinally striate. *Ovary* oblong, when young thin,

almost succulent; placentas much intruded; style linear, with 2 round stigmatic lobes. *Capsule* broad-ellipsoid, crustaceous, almost succulent (dehiscence not clear); style persistent; seeds 300 μ in diam., ovoid, somewhat angular, brown.

PERAK, Waterloo: *Robertson* 9088. SELANGOR: Sua Batu, *Ridley*; Gua Batu, *Ridley* 8218. KEDAH: Langkaui, *Curtis* 2516.

This species, the only one in the sub-genus, differs in the æstivation of the corolla, the number of the stamens, the anthers all equal, the persistent style, from the characters assigned to *Canscora*.

4. CRAWFURDIA, Wall.

Glabrous twiners. *Leaves* opposite, petioled, 3-nerved. *Flowers* showy, axillary. *Calyx* tubular; teeth 5 (or 4), long, often very long. *Corolla* long, tubular-funnel-shaped; lobes 5, short. *Stamens* 5 on the corolla-tube; anthers oblong. *Ovary* stalked, 1-celled, placentas parietal; style linear, stigmas 2, short-oblong. *Fruit* globose or ellipsoid, berried or capsular; seeds many, 2- (or imperfectly 3-) angled.—DISTRIB. Species 10–12, extending from India to Manchuria.

1. CRAWFURDIA BLUMII, G. Don Syst. IV. 200. *Stem* often 3 to 4 feet long. *Leaves* (blade) 1·5 by ·75 in., ovate-lanceolate, acute, entire; base rounded or narrowed; petiole ·35 in. *Flowers* axillary, solitary, sub-sessile, or the pedicel ·25 to 1·5 in. long. *Calyx* narrow, angular; tube ·2 in. long, teeth ·25 in. long, linear. *Corolla* 1·25 to 1·5 in. long, light purple. *Fruit* ·6 in. long, ellipsoid, purple, succulent. *Seeds* imperfectly 3-angular, angles (or 2 of them) often narrowly winged. Miq. Fl. Ind. Bat. v. II. 561 (*Blumei*). *C. trinervis*, Hassk. Cat. Hort. Bogor. 128, in Tidjsch. Nat. Gesch. X. 126. *Tripterospermum trinerve*, Blume Bijd. 849; Griseb. in DC. Prod. IX. p. 121. [*Cf.* C. B. Clarke in Fl. Br. Ind. IX. p. 107, sub *Crawfurdiâ affini*, Wallich.]

PAHANG, 7,000 feet alt.: *Wray* 1570.—DISTRIB. Sumatra, Java.

5. VILLARSIA, Vent.

Floating, glabrous herbs. *Leaves* long-petioled, ovate, entire or sinuate. *Peduncles* solitary, 1- (or many-) flowered. *Calyx* deeply 5-lobed. *Corolla* broadly campanulate; tube short, lobes sub-rotate. *Stamens* 5; filaments filiform, on the corolla-tube; anthers sagittate. *Ovary* 1-celled; style short; stigma of 2 small lobes; placentas parietal. *Capsule* globose, 1-celled, 4-valved at the apex; seeds several (or numerous).—DISTRIB. Species 12, in Africa or in Australia, except the following Malay species.

1. VILLARSIA AURANTIACA, Ridley MS. A small herb; stems 2 in.

long, with leaves and peduncles at the nodes. *Leaves* all long-petioled, ·35 in. in diam., widely excavated at the base, ovate, margin sinuate; petiole ·5 to 2 in. long. *Peduncles* solitary, 1 to 2 in. long, ebracteate, 1-flowered. *Calyx* ·17 in. long, lobes oblong. *Corolla* ·35 in. in diam.

PAHANG: Kwala Pahar, *Ridley*.

This example shows no fruit, and the flowers are not in a state for dissection. This collection has been supposed to be near *Limnanthemum parvifolium*, Griseb., which has smaller flowers, with the peduncles (several) clustered in the axil of a sessile leaf. This plant of Ridley appears to come near the Swan River *Villarsia violifolia*, F. Muell.

6. LIMNANTHEMUM, S. P. Gmel.

Peduncles several in the axil of a nearly sessile leaf. *Capsule* thin, breaking up irregularly, otherwise as *Villarsia*.—DISTRIB. Species 20, dispersed throughout the Tropical and Temperate Zones.

1. LIMNANTHEMUM PARVIFOLIUM, Griseb. in DC. Prod. IX. 141. *Stem* 3 to 8 in. long, slender, with distant nodes. *Leaf* ·75 in., round, ovate, excavated at base, gland-dotted on the under surface; petiole scarcely ·08 in. *Pedicels* clustered, 0 to ·25 in. long. *Calyx-lobes* ·08 in. long, lanceolate, acute. *Corolla-lobes* ·17 in. long, white, fimbriate. *Capsule* ·17 in. long, ellipsoid, sessile, about 10-seeded; seeds smooth but with capitate papillæ sparsely irregularly scattered. Hook. fil. Fl. Brit. Ind. IV. 132; Trimen, Fl. Ceyl. III. 189.

SINGAPORE: *Cuming* 2280 (in Mus. Brit.).—DISTRIB. Malabar, Ceylon; Chittagong to Tavoy.

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Materials for a Flora of the Malayan Peninsula.—*By* Sir George King, K.C.I.E., LL.D., F.R.S., F.L.S., *late Superintendent of the Royal Botanic Garden, Calcutta, and* J. Sykes Gamble, Esq., C.I.E., M.A., F.R.S., F.L.S., *late of the Indian Forest Department.*

No. 17.

This contribution embraces the Natural Orders *Myrsinaceæ*, *Sapotaceæ*, *Ebenaceæ*, *Styraceæ*, *Oleaceæ*, which are given under the joint names of the authors, the actual descriptions having been prepared by Sir George King for the *Ebenaceæ* and by Mr. J. S. Gamble for the rest.

The 5 Natural Orders comprise 24 genera and 221 species. There are no new genera, but the number of new species reaches 103.

Order LXX. MYRSINACEÆ.

Trees, shrubs (erect or climbing), or undershrubs, generally evergreen. *Leaves* usually alternate, sometimes opposite, entire dentate or crenate, often dotted with pellucid round or linear resinous glands. *Stipules* none. *Flowers* regular, usually small, white or reddish; hermaphrodite or occasionally polygamo-diœcious; generally in panicles, racemes or umbels. *Calyx* inferior (in *Mæsa* adnate to the ovary), 4–6-lobed, the lobes valvate or imbricate, sometimes enlarged in fruit, persistent, often marked with glandular dots or lines. *Corolla* 4–5-lobed; the tube usually very short, sometimes wanting; lobes twisted to the left in the bud, usually overlapping to the right, rarely valvate, often gland-dotted or -striate. *Stamens* opposite to the corolla-lobes and equal to them in number, free or adnate to the lobes or in an inner ring, generally erect; filaments long or short; anthers opening by slits, usually introrsely, sometimes septate as in *Ægiceras* and *Ardisia littoralis*, sometimes with terminal openings as well, free or adherent by their edges; the connective often thickened and produced, sometimes glandular; staminodes sometimes present, though not in Malay species. *Ovary* globose, ovoid or oblong, free (in *Mæsa* adherent to the calyx-tube), 1-celled, narrowed into or surmounted by the style; style filiform or columnar, stigma usually simple; ovules few or many, inserted on or immersed in a free usually globose central placenta. *Fruit* usually small, globose (in *Ægiceras* linear, curved, acuminate); epicarp fleshy, mesocarp crustaceous, endocarp membranous, separable; usually one- rarely several-seeded (as in *Mæsa*), indehiscent. *Seeds* usually globose, hollowed at the base: in *Mæsa* many and angled; albumen pitted or ruminate; embryo transverse, cylindric; radicle usually elongate.—DISTRIB. Tropical or sub-tropical regions of both hemispheres, chiefly in Asia and South America; genera 32, species upwards of 900 (according to Mez Monog. *Myrsineæ*).

- Calyx-tube adnate to the ovary; fruit many-seeded (Tribe I. MÆSEÆ):—
  - Trees or shrubs; calyx 2-bracteolate; flowers in simple or compound racemes .. .. 1. MÆSA.
- Calyx-tube free from the ovary; fruit one-seeded (Tribe II. EUMYRSINEÆ):—
  - Fruit round; anther-cells usually opening by slits, rarely septate:—
    - Corolla-lobes imbricate in bud:—
      - Flowers in axillary or lateral fascicles; trees or shrubs .. 2. MYRSINE.
      - Flowers in racemes or panicles; climbing plants, rarely shrubs .. .. 3. EMBELIA.
    - Corolla-lobes valvate in bud; flowers in paniculate spike-like racemes; small shrubs with parallel-veined leaves .. 4. LABISIA.
    - Corolla-lobes contorted in bud:—
      - Anthers sagittate, rarely septate; corolla-lobes overlapping to the right .. .. 5. ARDISIA.
      - Anthers sagittate-lanceolate, the connective produced in a membranous wing; corolla-lobes overlapping to the left .. 6. ANTISTROPHE.
  - Fruit elongate, cylindric, long-pointed; anthers markedly septate 7. ÆGICERAS.

1. MÆSA, Forsk.

Trees or shrubs, erect or straggling. *Leaves* entire, dentate or serrate, usually pellucid-punctate, sometimes with resinous lines. *Flowers* hermaphrodite or unisexual, in terminal or axillary racemes, the pedicels bracteate. *Calyx* bibracteolate, 4–5-lobed; lobes persistent, imbricate; the tube adnate to the ovary, sometimes with resinous lines. *Corolla* shortly campanulate, 4–5-lobed; the lobes usually as long as the tube or rather shorter, rounded with inflexed tips, sometimes resinous-lineate. *Stamens* 4 or 5, inserted on the corolla-tube; filaments short; anthers introrse, oblong-cordate. *Ovary* adnate to the calyx-tube; style short; stigma small, entire or shortly 3–5-lobed; ovules numerous, placenta globose. *Fruit* small, dry or fleshy, ovoid or subturbinate, crowned with the persistent style, many-seeded. *Seeds* numerous, angular, immersed in hollows of the placenta, and arranged around it with hexagonal surfaces, embryo small, oblique or transverse, cotyledons narrowly ovate.—DISTRIB. Species over 100 (according to Mez), chiefly in the tropical regions of the Old World, a few in Australia and the Pacific Islands; all the Malayan species belonging to sub-genus *Eumæsa*, Mez.

Leaves entire:—
  Flowers in large terminal leafy panicles; branches of the inflorescence pubescent .. .. 1. *M. macrothyrsa.*
  Flowers in large axillary or pseudo-terminal panicles of racemes; branches of inflorescence glabrous .. .. 2. *M. ramentacea.*
Leaves faintly lobed:—
  Leaves very slightly dentate, almost coriaceous, under 3·5 in. long, midrib and main-nerves very prominent; inflorescence as long as or only a little shorter than leaves .. .. 3. *M. impressinervis.*
  Leaves membranous, over 4 in. long:—
    Leaves pale when dry, under 3 in. broad, distantly dentate, inflorescence longer than the petiole .. .. 4. *M. striata.*
    Leaves dull green when dry, over 4 in. broad, inflorescence scarcely longer than the petiole .. .. .. 5. *M. pahangiana.*
Leaves prominently dentate .. .. .. 6. *M. indica.*

1. MÆSA MACROTHYRSA, Miq. Fl. Ind. Bat. Suppl. 573 (1862). A slender climbing shrub reaching 30 to 50 feet in length; branches brown, somewhat angled and flexuose, striate. *Leaves* entire, chartaceous; elliptic, shortly bluntly acuminate at apex, rounded at base; smooth and dull on both surfaces; 3 to 4 in. long, 1·5 to 2 in. broad; midrib prominent, impressed above; main-nerves 5 to 7 pairs, distant, starting from the midrib at about 60° and curving upwards; secondary nerves and reticulations indistinct; petiole ·5 to ·7 in. long, channelled above by the decurrent margins of the blade. *Inflorescence* a large leafy terminal many-flowered tripinnate panicle, the branches rusty pubescent; pedicels about ·025 in. long, supported by a slightly shorter ovate-acute bract, and bearing 2 similar bracteoles below the flowers. *Calyx* superior, cupular; lobes 4, occasionally 5, rounded, denticulate, ·04 in. long, gland-dotted; tube very short. *Corolla* dull white or pink, longer than calyx; tube as long as lobes; lobes 4 or 5, rounded, often with

small lobules between, denticulate, with about 3 to 4 glandular lineoles. *Stamens* inserted near the base of the corolla-tube; anthers globose; filaments about twice as long as anthers. *Ovary* rounded, depressed, crowned with a short cylindric style and obtusely 3–4-lobed stigma. *Fruit* very small, ·05 in. in diam., globose, glabrous, faintly striate, crowned about one-third of the way down with the persistent calyx-teeth. *Seeds* very minute, angled. Scheff. Myrs. 29; Mez Monog. Myrs. 49. *M. floribunda*, Scheff. Myrs. 18. *M. Korthalsiana*, Scheff. Myrs. 18 (?)

PERAK: *Wray* 2684; *Scortechini* 122, 1655; *King's Collector* 725, 2722, 3777, 4968, 5326.—DISTRIB. Sumatra, *Korthals*, *Beccari* 887; Borneo, *de Vriese*, *Teysmann*.

We have always found the flowers tetramerous, as described by Miquel and Scheffer. Mez describes them as either 4- or 5-merous. This is a well-marked species on account of its large terminal inflorescence, whose pubescent branches easily distinguish it from those occasional forms of *M. ramentacea* which have part of the inflorescence pseudo-terminal.

2. MÆSA RAMENTACEA, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 231 (1824). A large shrub or small tree, usually branched from the base and sending out many straggling or climbing branches often 30 to 40 feet long or more; branchlets smooth, somewhat striate when dry. *Leaves* entire, chartaceous; ovate-lanceolate or elliptic, acuminate at apex, rounded or cordate at base; 3 to 8 in. long, 1·5 to 4 in. broad; smooth on both surfaces and generally shining above; midrib prominent, often impressed above; main-nerves slender, distant, 5 to 10 pairs, starting at 45° with the midrib and curved upwards; secondary nerves and reticulations not apparent: petiole ·3 to ·5 in. long, slightly winged by the decurrent margins of the blade, which are often connivent above. *Inflorescence* axillary or sometimes pseudo-terminal, glabrous, many-flowered, consisting of more or less closely packed racemes arranged in bipinnate panicles, shorter or longer than the leaves; pedicels ·1 to ·15 in. long, slender, supported by a minute lanceolate bract and with 2 very minute ovate-lanceolate bracteoles below the flower; buds minute, globose, depressed at top. *Calyx* superior, cupular; tube very short, about ·025 in. long; lobes 5, ovate, faintly ciliate, as long as the tube. *Corolla* ·075 in. long; lobes half the length, ovate or ovate-reniform, edges undulate, with a few brown glandular lineoles. *Stamens* short, longer in ♀ flowers, inserted a little below the top of the tube; anthers rounded, filaments as long as the anthers, dorsifixed. *Ovary* in ♀ flowers adnate to the base of the calyx-tube, style short, stigma minutely 4-lobed, ovules many. *Fruit* globose, ·1 to ·15 in. long, crowned with the persistent teeth of the calyx; seeds minute, angled,

albuminous, embryo small, transverse. A. DC. in Trans. Linn. Soc. XVII. 133, Prod. VIII. 77; Scheff. Myrs. 15; Miq. Fl. Ind. Bat. II. 1006; Kurz in Journ. As. Soc. Beng. XLVI. ii. 220; For. Fl. II. 99; Clarke in Hook. f. Fl. Br. Ind. III. 508; Koord. & Val. Bijdr. V. 218; Mez Monog. Myrs. 27; Prain Beng. Pl. 642. *M. ovata*, A. DC. l.c. 133, t. 4, Prod. l.c. 77; Scheff. Myrs. 14. *M. lanceolata*, Don Prod. 148. *M. acuminata, missionis*, and *glabra*, DC. Prod. l.c. 77, 78, 82. *M. sumatrana*, Scheff. Myrs. 15. *Bæobotrys ramentacea*, Roxb. Hort. Beng. 16, Fl. Ind. I. 558; Wall. Cat. 2322. *B. ovata*, Wall. Cat. 2324. *B. glabra*, Roxb. Fl. Ind. I. 560. *B. fragrans*, Wall. Cat. 2323. *B* (?) *missionis*, Wall. Cat. 6523.

KEDAH: Langkawi, *Curtis* 2554, 3409. PENANG: *Wallich* 2324; *Maingay* (K.D.) 1001; *J. Scott*; *G. King*; *Phillips*; *Deschamps*. PERAK: *Scortechini* 382A, 606B, 628; *Wray* 1286, 1291, 1912, 2363, 2787; *King's Collector* 171, 1222, 1909, 2788, 3883, 4144, 4281, 4497, 4915, 5088, 5113; *Curtis*. PAHANG: *Ridley* 2175. SELANGOR: *Ridley*; *Goodenough* 10554. NEGRI SEMBILAN: *Ridley* 10067. MALACCA: *Griffith* (K.D.) 3552; *Cuming* 2286; *Miller* 9; *Hervey*; *Goodenough* 1036, 1742; *Derry* 37, 1063; *Ridley* 10099. JOHORE: *Lake & Kelsall* 4035; *G. King*. SINGAPORE: *Schomburgk* 91; *Lobb* 324; *T. Anderson* 126; *Ridley* 2064, 2805: *Goodenough* 1644; *Hullett* 38, 56, 885, 887.—DISTRIB. Eastern Bengal and Burma, Andaman and Nicobar Islands, Sumatra, Java, Borneo.

We follow Mez in not keeping up the VAR. *ovata*. The large mass of material available shows clearly that in shape of leaf and in inflorescence the variation is regular, and that the form with cordate long-acuminate leaves passes gradually into that with ovate broad short-acuminate leaves, and that similarly the inflorescence changes. A monstrous form with moss-like inflorescence similar to those often seen in India on *M. Chisia* and other species, is not uncommon.

3. MÆSA IMPRESSINERVIS, King & Gamble, n. sp. A bush or small tree; branches half as thick as a goosequill, glabrous, pale brown, and prominently longitudinally wrinkled when dry. *Leaves* thinly coriaceous; elliptic, shortly acuminate at apex, cuneate at base; entire or very faintly dentate only near the apex, margins recurved when dry, reticulate and shining above, dull and paler beneath; 3 to 3·5 in. long, 1·25 to 1·75 in. broad; midrib prominent, impressed above; main-nerves 7 or 8 pairs, also prominently impressed above and prominently raised on the lower surface, arching upwards to meet near the margin; secondary nerves few, inconspicuous as are the reticulations; petiole ·2 to ·25 in. long, bordered by the decurrent edges of the blade, which are almost connivent above. *Inflorescence* an axillary raceme, simple or with one short branch near the base, 1·5 to 2·5 in. long, and so shorter

than the leaves; pedicels slender, ·1 in. long, with a ·06 in. long subulate bract at the base and 2 similar bracteoles beneath the flower; buds nearly globose. *Calyx* superior, ·05 in. in depth, cupular, with 5 imbricate broad incurved concave glabrous lobes. *Corolla* rotate with 5 imbricate rounded broad lobes, ·1 in. deep; tube rather longer than lobes. *Stamens* 5, inserted on the base of the corolla; anthers globular; filaments flattened, longer than the anthers. *Ovary* inferior, depressed, surmounted by a flattened lobed stigma, 1-celled; ovules many, cuneate, on a central basal placenta. *Fruit* unknown.

PERAK: Gunong Bubu, at 5,000 feet elevation; *Wray* 3850, 3886.

4. MÆSA STRIATA, Mez Monog. Myrs. 42 (1901). A shrub or small tree; branches smooth, reddish, with scattered lenticels. *Leaves* membranous; rather variable, elliptic or elliptic-oblong, rounded or acuminate at apex, bluntly acute and sometimes unequal at base; entire or undulate or broadly dentate, especially on the upper half, pale green when dry, glabrous except for a few occasional stiff hairs on the midrib beneath, striate with many faint very slender lineoles; 4 to 7 in. long, 2·5 to 3 in. broad; midrib angular, prominent beneath, main-nerves 7 to 8 pairs, slender; secondary nerves and reticulations faint and irregular; petiole slender, ·4 to 1 in. long, channelled above. *Inflorescence* of axillary racemes, simple or joined in a sub-sessile panicle, rarely over 2 in. long; pedicels very slender, ·05 to ·1 in. long, with a subulate bract at base, half their length, and 2 acute bracteoles under the flower. *Calyx* superior, about ·1 in. deep; lobes 5, imbricate, ovate, rounded, about 4-striate, edges hyaline; tube as long as lobes. *Corolla* as long as calyx, rotate, ·1 in. in depth; lobes 5, imbricate, rounded, crenate, glabrous. *Stamens* 5, inserted near the base of the corolla; anthers ovate, slightly divaricate; filaments 2 to 3 times as long as anthers. *Ovary* inferior, depressed, rounded; style short cylindrical, stigma 4-lobed; ovules many, cuneate, on a central basal placenta. *Fruit* round, ·1 to ·15 in. in diam., smooth, faintly ribbed, crowned by the persistent calyx-lobes and style.

PENANG: at Paya Trobong, *Curtis* 2857. PERAK: *King's Collector* 2287.—DISTRIB. Sumatra, *Forbes* 1260, 1287, 1315, 1376.

5. MÆSA PAHANGIANA, King & Gamble, n. sp. Apparently a shrub; branches round, smooth, dark brown when dry. *Leaves* membranous; rhomboid-obovate, acuminate at the apex, rounded cuneate at base; faintly crenate especially in the upper half; glabrous on both dull surfaces; 7 to 8 in. long, 4 to 4·5 in. broad; midrib slender, prominent beneath; main-nerves distant, 8 to 9 pairs, at about half a right angle with the midrib, sometimes branched; secondary nerves few and like the reticulations indistinct; petiole slender, ·8 to 1 in. long. *Inflores-*

cence a simple axillary raceme, as long as or slightly longer than the petiole; pedicels slender, about ·1 in. long, supported by a minute subulate bract below and with two similar bracteoles below the flower. *Calyx* superior, cupular, with a very short tube and 5 triangular imbricate teeth ·6 in. long, glabrous, hyaline at the edges and very faintly brown-glandular. *Corolla* as long as calyx; lobes 5 imbricate, glabrous, rounded, somewhat crenate, with 2 to 3 prominent brown glandular lineoles; tube half the length. *Stamens* nearly as long as corolla, inserted near its base; filaments about twice as long as the anthers; anthers emarginate, cells somewhat divaricate. *Fruit* globose with a conical tip surrounded by the remains of the corolla and the persistent calyx, and surmounted by the short persistent style, ribbed, ·125 in. in diam., glabrous.

PAHANG: at Tanjong Antan, *Ridley* 2175A.

Only one specimen is unfortunately available, and that in fruit, with only remains of flowers.

6. MÆSA INDICA, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 230 (1824). A shrub reaching 4 to 6 feet in height; branchlets brown, smooth, lenticellate. *Leaves* chartaceous; elliptic or elliptic-oblong, acuminate, rounded or acute at the base; repand-dentate, about 3 teeth to each main-nerve; 3 to 7 in. long, 2 to 3 in. broad; midrib very prominent, often broad; main-nerves 8 to 12 pairs, others closely reticulate; glandular striæ long, prominent; petiole ·5 to 1 in. long, channelled above by the decurrent bases of the blade. *Inflorescence* of simple or compound axillary racemes, much shorter than the leaves, usually 1 to 3 in. long; pedicels slender, ·05 to 1 in. long, longer in fruit; bracts subulate, in flower as long as pedicels; bracteoles 2, minute. *Calyx* superior, with 5 imbricate lobes, which are ovate, ciliate, striate, about ·04 in. long, almost acute or rounded at apex. *Corolla* as long as calyx; lobes denticulate, glandular-striate; tube as long as lobes. *Stamens* inserted at base of corolla-tube; anthers ovate, cells divaricate; filaments dorsifixed, rather longer than anthers. *Ovary* rounded; style short cylindric, stigma obtuse; ovules many. *Fruit* round, smooth, striate, ·15 in. long, crowned at the summit by the persistent calyx-lobes and the remains of the stigma. *Seeds* angular. A. DC. in Trans. Linn. Soc. XVII. 134, Prod. VIII. 80 (*in part*); Wall. Cat. 2318 E.; Clarke in Hook. f. Fl. Br. Ind. III. 509 (*in part*); Koord. & Val. Bijd. V. 222; Mez Monog. Myrs. 29. *Bæobotrys indica*, Roxb. Hort. Beng. 16, Fl. Ind. I. 557.

PERAK: *Wray* 3314, 3349; *Scortechini* 16, 733; *Ridley* 3007, 9741; *King's Collector* 7712.—DISTRIB. Burma, Java.

2. MYRSINE, Linn.

Trees or shrubs. *Leaves* entire or serrate, often thick, usually pellucid-punctate. *Flowers* polygamous or diœcious, fascicled, axillary or on very short branches, pedicels short with many imbricate bracts. *Calyx* small, lobes 4 to 5 persistent. *Corolla* 4–5-lobed, the lobes imbricate in bud, recurved in flower. *Stamens* 4 to 5; filaments short, inserted at the base of the corolla-lobes; anthers short, ovate; staminodes none. *Ovary* free, globose or ovoid; style usually short, cylindric or angular; stigma capitate or 2–5-lobed; ovules few or many, immersed in the placenta. *Fruit* a small, dry or somewhat fleshy, berry, 1-seeded. *Seed* solitary, globose, sessile, hollowed at the base; albumen pitted; embryo elongate, cylindric or curved, horizontal.—DISTRIB. Species about 80, chiefly tropical, a few in Japan, extra-tropical Africa, Australia and New Zealand. All our species belong to Mez' genus *Rapanea.*

Arrested branches bearing the umbels very short, ·1 in. long or under:—
  Leaf-nerves and reticulations obscure, leaves small, under 2·5 in. 1. *M. avenis.*
  Leaf-nerves and reticulations visible, leaves usually over 2·5 in:—
    Leaves under 4 in. long, chartaceous, blackish when dry; pedicels short, ·1 in. long .. .. 2. *M. Porteriana.*
    Leaves over 4 in. long, coriaceous, reddish when dry; pedicels over ·15 in. long .. .. 3. *M. perakensis.*
Arrested branches bearing the umbels ·3 in. long or more:—
  Leaves rounded at apex; berry ·2 in. in diam. .. .. 4. *M. Wrayi.*
  Leaves emarginate at apex; berry ·3 in. in diam. .. .. 5. *M. umbellulata.*

1. MYRSINE AVENIS, A. DC. in Trans. Linn. Soc. XVII. 107 (1834). A small tree; branches pale, rounded; branchlets wrinkled when dry, faintly ferruginous-tomentose, leaf-buds long acuminate. *Leaves* entire, chartaceous; oblong-lanceolate, bluntly acute at apex, acutely narrowed at base, glabrous, marked with resinous often very conspicuous lineoles and dots along the margin especially near the apex, margins usually recurved; 1 to 2·5 in. long, ·5 to ·75 in. broad; midrib prominent, impressed above; main-nerves very obscure as are the reticulations; petiole ·2 in. long, slender, edged with the ciliate margins of the decurrent blade. *Flowers* in compact sessile 2–5-flowered umbels on very short thick arrested branches; bracts oblong acute; pedicels about ·1 in. long, angular; flower-buds ovate, flowers 5-merous. *Calyx-lobes* triangular, acute, ciliate, with few round glandular dots; tube as long as lobes. *Corolla-lobes* imbricate, elliptic, pubescent on the margins, sparsely round-gland-dotted, connate for about one-third of their length. *Stamens* as long as corolla-lobes; anthers

ovate, apiculate, pubescent at tip; filaments and lower part of anthers attached about half-way up the corolla-lobes. *Ovary* rounded, conical; style short in ♂, oblique and with long channelled stigma in ♀. *Berry* globose, ·1 in. in diam., glandular, smooth, tipped with the persistent style. DC. Prod. VIII. 96; Miq. Pl. Jungh. 189, and Fl. Ind. Bat. II. 1015; Scheff. Myrs. 47; Koord. & Val. Bijdr. V. 234. *Myrsine capitellata*, Wall. var. *avenis* Clarke in Hook. f. Fl. Br. Ind. III. 512 (*in part*); Stapf in Trans. Linn. Soc. Ser. 2, IV. 199. *Ardisia avenis*, Blume Bijdr. 691. *Rapanea avenis*, Mez Monog. Myrs. 357.

Singapore: *Ridley* 253.—Distrib. Java, Celebes, Borneo.

2. Myrsine Porteriana, Wall. Cat. 6525 (1829). A shrub or small tree; branches grey, rough; branchlets slender, angled when dry, leaf-buds lanceolate. *Leaves* chartaceous, entire; oblong-lanceolate, bluntly acute and slightly emarginate at apex, cuneately narrowed at base, glabrous, glandular dotted, especially along the margin, and often glandular-lineolate, black or greyish when dry; 1·5 to 3·5 in. long, ·75 to 1·25 in. broad; midrib prominent beneath, impressed above; main-nerves 8 to 12 pairs, the lowest pair running parallel to the midrib and there joined by the rest, not always easily seen; secondary nerves few, slender, reticulations minute; petiole slender, ·2 to ·4 in. long, channelled above by the decurrent and almost connivent, slightly fimbriate, edges of the blade. *Flowers* in compact sessile umbels on the summit of a short thick cone-like bracteate arrested branch about ·1 to ·3 in. long; bracts ovate, bracteoles oblong, blunt, ciliate; pedicels angled ·1 in. long; flower-buds ovate, flowers greenish-white, usually diœcious, 5-merous. *Calyx-lobes* ovate acute, ·05 in. long, ciliate, marked with prominent dark round or lineolate glands; tube as long as lobes. *Corolla-lobes* oblong obtuse, ·1 to ·15 in. long, minutely pubescent on the margins, marked by prominent dark rounded and lineolate glands, connate to one-fourth of their length, revolute in flower. *Stamens* inserted on the corolla, the filaments and lower half of the anthers adnate with it, those of ♂ flowers ovate apiculate, those of ♀ flowers sagittate; in open flowers exsert, longer than the revolute lobes. *Ovary* ovoid, glabrous, ♂ flowers with a short straight style, ♀ flowers with an oblique style and oblique folded stigma. *Berry* globose, glabrous, ·1 in. in diam., dark blue when fresh, pale when dry, striate from the elongated vertical glands. A. DC. in Trans. Linn. Soc. XVII. 106, Prod. VIII. 95. *M. capitellata* var. *avenis*, Clarke in Hook. f. Fl. Br. Ind. III. 512 (*in part*). *Rapanea Porteriana*, Mez Monog. Myrs. 358.

Penang: *Porter* in *Wallich* 6525; *Maingay* (K.D.) 1005; *Curtis* 1013, 3728, on Government Hill, road to Crag. Perak: *Ridley* 2992; *Wray* 678, 1537; *King's Collector* 5001, usually at 5,000 feet elevation. PAHANG: *Ridley* 1669A. SELANGOR: *Ridley* 8208. MALACCA: *Griffith* (K.D.) 3543; *Ridley* 10076, on Mount Ophir.

3. MYRSINE PERAKENSIS, King & Gamble, n. sp. A tree; branchlets thick, smooth, wrinkled when dry, terminal leaf-buds lanceolate. *Leaves* entire, coriaceous; oblong, bluntly acute at apex, narrowed at the base, glabrous, shining above, margins recurved, glandular dots many, inconspicuous; 4 to 5 in. long, 1·5 to 2 in. broad; midrib thick, very prominent; main-nerves 20 to 26 pairs, prominent above, at about two-thirds of a right angle with the midrib, parallel at first, arching afterwards to meet near the margin; secondary nerves similar but more slender, reticulations prominent; petiole ·3 in. long, very thick, winged by the decurrent margins of the blade. *Flowers* in compact sessile umbels on the summit of a thick, cone-like, bracteate, arrested branch about ·1 in. long, in the axils of the leaves or below them on the current year's wood, so forming a thick cluster below the terminal leaves: umbels 5–8-flowered, pedicels ·15 to ·2 in. long, thick and angular when dry; bracts ovate, scaly, sometimes ciliate. *Calyx-lobes* ovate acute, glandular-ciliate, about ·05 in. long, ciliæ jointed. *Corolla* and *Stamens* unknown. *Berry* globose, sometimes conical at top, ·1 to ·15 in. in diam., pericarp pale brown when dry, striate with obscure oblong glands.

PERAK: *Wray* 3856; *Scortechini*, 766, at 5,000 feet elevation.

4. MYRSINE WRAYI, King & Gamble, n. sp. A tree; branchlets stout, striate when dry. *Leaves* entire, coriaceous; elliptic-oblong, rounded at the apex, narrowly cuneate at base; 3 to 5 in. long, 1 to 1·75 in. broad, glabrous; midrib slender; main-nerves very obscure, about 12 pairs, meeting in an intramarginal nerve near the edge, reticulations many, somewhat raised beneath when dry; petiole ·5 to ·7 in. long, bordered above by the decurrent margins of the blade, wrinkled at the base. *Flowers* in peduncled axillary few-rayed umbels; bracteoles minute, triangular; peduncles ·3 to ·5 in. long; rays of umbel 3 to 4, pedicels about ·35 in. long, clavately thickened above. *Calyx-lobes* triangular-ovate, glandular-ciliate, acute, ·05 in. long. *Corolla* and *Stamens* unknown. *Fruit* round, ·2 in. in diam., crowned by the persistent base of the style; pericarp rugosely striate.

PERAK: *Wray* 232, at 4,500 feet.

5. MYRSINE UMBELLULATA, A. DC. in Trans. Linn. Soc. XVII. 135 (1834). A small tree; branchlets thick, glabrous, reddish-brown *Leaves* entire, coriaceous; elliptic-obovate, obtuse and emarginate at apex, acute at the base; glabrous above, rusty beneath, black glandular dots frequent, margins often recurved; 2 to 3·5 in. long, ·75 to 1·25 in. broad; midrib prominent, slender; main-nerves inconspicuous, slender, raised on upper surface, depressed on lower, reticulations obscure;

petiole ·3 to ·5 in. long, rugose, bordered above by the decurrent margins of the blade. *Flowers* in axillary scattered umbels on thick cone-like bracteate arrested branches, about ·15 in. long; pedicels very slender, ·3 to ·4 in. long, glabrous. *Calyx-lobes* ovate, acute, very shortly ciliolate, minute, recurved in fruit. *Corolla* and *Stamens* unknown. *Berry* globose, ·3 in. in diam., smooth, pale when dry, crowned with the persistent style. A. DC. Prod. VIII. 95; Miq. Fl. Ind. Bat. II. 1014. *M. capitellata*, var. *avenis*, Clarke in Hook. f. Fl. Br. Ind. III. 512 (*in part*). *Embelia umbellulata*, Wall. Cat. 2312. *Rapanea umbellulata*, Mez Monog. Myrs. 362.

SINGAPORE: *Wallich* 2312.—DISTRIB. Sumatra, Borneo.

3. EMBELIA, Burm.

Small trees or shrubs, usually climbing, often extensively. *Leaves* alternate, entire, dentate or serrulate, usually glandular, petiole often margined. *Flowers* in axillary or terminal racemes, simple or paniculate, white or pink, hermaphrodite or polygamo-diœcious. *Calyx* free, 4–5-lobed, persistent, the lobes rounded or ovate. *Corolla* 4–5-lobed, the lobes imbricate or contorted, tube none or short. *Stamens* 4 to 5; filaments short or elongate, inserted on the corolla; anthers ovate-oblong, obtuse or acute; staminodes none. *Ovary* ovoid, globose or conical; style short; stigma capitate; ovules few, inserted on a subglobose placenta. *Fruit* a small drupe, globose, 1-seeded, crowned by the persistent style. *Seed* ovoid, hollowed at the base, albumen pitted, embryo transverse, curved.—DISTRIB. About 60 species, in the tropical regions of the Old World.

Inflorescence terminal or terminal and axillary, paniculate:—
Petals free (Sect. I. EUEMBELIA):—
Leaves membranous or chartaceous:—
Main-nerves of leaves slender, not prominent:—
Petals sparingly villous, anthers with a cluster of black warts behind .. .. 1. *E. Ribes.*
Petals densely villous, anthers with only small glandular warts behind:—
Leaves elliptic, 1·5 to 2 in. broad, shortly acuminate .. 2. *E. canescens.*
Leaves oblong, ·75 in. broad, long but obtusely acuminate 3. *E. dasythyrsa.*
Main-nerves of leaves prominent:—
Branches slender, leaves lanceolate acuminate, flowers densely villous .. .. 4. *E. Scortechinii.*
Branches stout, leaves suddenly acuminate, flowers glabrous or slightly pubescent only .. .. 5. *E. penangiana.*
Leaves coriaceous:—
Panicles long, leaves moderately thick:—
Leaves acute or cuneate at base, main-nerves conspicuous, bracteoles as long as the pedicels .. .. 6. *E. pergamacea.*

Leaves rounded or cordate at base, main-nerves very prominent, bracteoles shorter than the pedicels .. .. 7. *E. coriacea.*

Panicles short, stout, leaves very thick .. .. 8. *E. angulosa.*

Petals joined at the base into a tube (Sect. II. GRENACHERIA) :—

Leaves rusty-villous beneath, bracts of the inflorescence short, inconspicuous .. .. 9. *E. Lampani.*

Leaves pubescent or nearly glabrous beneath, bracts of the inflorescence long, often leafy, conspicuous .. .. 10. *E. amentacea.*

Inflorescence axillary :—

Inflorescence paniculate, axillary, 1 to 2 in. long (Sect. III. PATTARA) .. .. 11. *E. Ridleyi.*

Inflorescence much shorter than the leaves, on very short racemose branchlets with many bracts (Sect. IV. MICREMBELIA) :—

Flowers tetramerous, leaves coriaceous .. .. 12. *E. Myrtillus.*

Flowers pentamerous, leaves chartaceous .. .. 13. *E. parviflora.*

SPECIES IMPERFECTLY KNOWN: 14. *E. lucida.* 15. *E. macrocarpa.*

1. EMBELIA RIBES, Burm. Fl. Ind. 62. t. 23 (1768). An evergreen climbing shrub; branches pale brown, with thick bark studded with conical protuberances; branchlets pale brown, smooth, lenticellate. *Leaves* entire, chartaceous; elliptic or elliptic-lanceolate, obtusely acuminate at apex, cuneate at base; glabrous above, glabrous or minutely pubescent beneath, glandular dots scattered, sometimes obscure; margin generally recurved; 2 to 3 in. long, 1 to 1·5 in. broad; midrib slender, prominent below, generally impressed above; main-nerves obscure, irregular, slender, 12 to 14 pairs, parallel at first then curved upwards to join near the margin; secondary nerves many faint, reticulations very obscure; petiole ·3 to ·5 in. long, bordered by the crisped edges of the decurrent blade. *Inflorescence* a large terminal leafy 3-pinnate grey- or rusty-pubescent panicle of racemes, the branches at first turning upwards, afterwards nearly at right angles with the rachis; bracts leafy, smaller by degrees upwards; bracteoles subulate, shorter than the slender pedicels, ·05 in. long; buds small, globose; flowers white. *Calyx-lobes* very minute, about ·025 in. long, triangular-acute, ciliate, with few glandular dots; tube as long as lobes. *Corolla-lobes* free, elliptic, rounded at top in ♀, more acute in ♂, ·05 in. long, ciliate, sparingly villous-pubescent, apex incurved, with few prominent glandular dots. *Stamens* inserted on the corolla-lobes, about half-way up in ♂, lower down in ♀, shorter than the lobes; anthers short, ♂ with parallel, ♀ with divaricate, cells, both with a long black mass of glandular warts behind at the insertion of the dorsifixed filaments. *Ovary* ovoid, glabrous; style short, stigma capitate in ♂, peltate and larger in ♀. *Berry* globose or sometimes pyriform, red or black, glabrous, succulent, wrinkled when dry, aromatic, ·1 to ·15 in. in. diam., crowned with the persistent style and

stigma. Retz. Obs. iv. 24; Lamk. Ill. t. 133; Roxb. Fl. Ind. i. 586; Wall. Cat. 2304; A. DC. in Trans. Linn. Soc. XVII. 129, Prod. VIII. 85 (*part*); Scheff. Myrs. 38; Miq. Fl. Ind. Bat. II. 1011; Dalz. & Gibs. Bomb. Fl. 137; Brandis For. Fl. 284; Kurz For. Fl. II. 101; Clarke in Hook. f. Fl. Br. Ind. II. 513; Trimen Fl. Ceyl. III. 69; Cooke Bomb. Fl. II. 84; Mez Monog. Myrs. 303; Prain Beng. Pl. 643. *E. Burmannii*, Retz Obs. IV. 23. *E. garciniæfolia*, Wall. Cat. 2304C and E; Miq. l.c. 1011; Scheff. Myrs. 40. *E. sumatrana*, Miq. l.c. 1012. *E. glandulifera*, Wight Ic. 1207; Dalz. & Gibs. Bomb. Fl. 137. *Samara Ribes*, Kurz in Journ. As. Soc. Beng. XLVI. 222. *Ardisia tenuiflora*, Bl. Bijdr. 687.

PENANG: *Deschamps, Curtis.* PERAK: *Wray* 420; *Scortechini*; *King's Collector* 928, 1150, 6999 (abnormal state, most of the flowers converted into leafy bracts). MALACCA: *Griffith* (K.D.) 3550; MAINGAY (K.D.) 1002; *Cuming* 2320. JOHORE: *Native Collector* 3749. SINGAPORE: *Ridley* 10643, 2803 (fruits converted into insect galls); *Kurz* 2965.—DISTRIB. India, Burma and Ceylon; Malay Islands and eastwards to South China.

VAR. *rugosa*, King & Gamble. Branchlets dark brown, much wrinkled and with oblong lenticels. *Leaves* 4 to 5 in. long, 1·5 to 2 in. broad, usually thicker than the type. *Racemes* less pubescent than in type, the flowers often collected near the ends of the ultimate branches of the inflorescence. *Stamens* of ♂ flowers exsert. *Stigma* of ♀ much larger than that of ♂ flowers, peltate. *Berry* rugose, conically tipped; pericarp thick, fleshy, with cavities.

PERAK: *Wray* 2278, 2576, 3069; *King's Collector* 2512, 3001, 4040. SINGAPORE: *Ridley* 10384.

We find no Malay specimens with the large glandular pits so well marked in South Indian specimens (*Embelia glandulifera*, Wight Ic. 1207). Wight's figure is not well drawn in several respects, and especially as to the nervation of the leaves, so it is not very easy to make sure about it, but there seems no reason to separate *E. glandulifera* from *E. Ribes* unless perhaps as a variety. It has usually a much shorter and fewer-flowered inflorescence.

2. EMBELIA CANESCENS, Jack; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 292 (1824). A climbing shrub with slender, villous, subflexuose branches. *Leaves* entire, chartaceo-membranous; elliptic, shortly acuminate at apex, rounded or sub-cordate at base, glabrous or slightly pubescent and shining above, canescent beneath; glandular dots many, not prominent, in the areoles of the reticulations; 2 to 3·5 in. long, 1·5 to 2 in. broad; midrib prominent, impressed above, villous beneath; main-nerves about 10 pairs, irregular, curving upwards to join at some distance from the margin; secondary nerves many, slender,

reticulations irregular; petiole ·3 to ·4 in. long, bordered above by the prominently crispate edges of the decurrent blade, rugose beneath. *Inflorescence* a slender terminal 3-pinnate leafy panicle of distant comparatively few-flowered racemes, 4 to 8 in. long; rachis and its branches densely rusty-villous; bracts leafy below, spathulate above, bracteoles subulate, deciduous, about half as long as the ·05 to ·1 in. long pedicels which are longer in fruit; buds very minute, globose. *Calyx-lobes* very small, triangular, pubescent; tube as long as lobes. *Corolla-lobes* oblong, free, blunt, ·06 in. long, densely villous without, papillose within and glandular-dotted. *Stamens* shorter than the corolla-lobes, inserted near their base; anthers rounded, warted with inconspicuous glands behind at the insertion of the dorsifixed filaments. *Ovary* in ♂ flower rudimentary. *Berry* globose, somewhat conical above, rugose when dry, crowned with the remains of the persistent style, ·2 in. in diam.- Wall. Cat. 2311; A. DC. Prod. VIII. 85; Scheff. Myrs. 42; Miq. Fl. Ind. Bat. II. 1012; Clarke in Hook. f. Fl. Br. Ind. III. 514; Mez Monog. Myrs. 305.

PENANG: *Jack; Porter.* PERAK: *Ridley* 7172 (*part*). MALACCA: *Maingay* (K.D.) 1004. SINGAPORE: *Goodenough* 2804; *Hullett* 115.

3. EMBELIA DASYTHYRSA, Miq. Fl. Ind. Bat. Suppl. 573 (1862). A slender climbing shrub; branches minutely pubescent, striate, with prominent raised lenticels; branchlets dark, slender, rusty-villous. *Leaves* entire, chartaceous; oblong or elliptic-oblong, bluntly acuminate at apex, rounded at base; glabrous above, glabrous except on the midrib beneath, glandular dots scattered, obscure; 1·5 to 2 in. long, about ·75 in. broad; midrib prominent beneath, villous, impressed above, main-nerves 10 to 12 pairs, irregular, arching upwards to meet near the margin; secondary nerves few, slender, reticulations obscure; petiole ·1 to ·2 in. long, channelled above. *Inflorescence* a long, 3-pinnate, leafy panicle of long slender many-flowered racemes, rachises minutely pubescent; bracts leafy, bracteoles subulate, minute, much shorter than the ·1 in. long very slender pedicels; buds globose shaggy, flowers grey. *Calyx-lobes* minute, about ·03 in. long, triangular, ciliate; tube shorter than lobes. *Corolla-lobes* free, ovate-spathulate, about ·06 in. long, black-gland-dotted, densely covered with short moniliform hairs. *Stamens* less than half the length of the corolla-lobes, inserted at the base; anthers reniform, with inconspicuous glandular warts on the back at the insertion of the dorsifixed filaments, which are almost shorter than the anthers. *Ovary* ovoid, style very short, stigma in ♂ small capitate, in ♀ peltate, large. *Berry* red or black, ·15 in. in diam., globose or slightly pyriform, wrinkled when dry, tipped by the persistent style and stigma. Scheff. Myrs. 42; Mez Monog. Myrs. 305.

Perak: *Wray* 1924; *Scortechini* 498; *King's Collector* 776, 4103, 4375, 5102, 5762, 6640, 8583, 10024, 10701, clinging to trees in dense jungle at low levels. Selangor: *Ridley* 7572. Singapore: *Hullett* 118.—Distrib. Bangka, *Teysmann* Hort. Bogor. No. 3189, at Djeboes.

Only one very poor specimen of the type (Teysmann's) is available, but from an examination of it and from Miquel's description it seems to be right to refer the Peninsular plant, which we had considered new, to this species.

4. Embelia Scortechinii, King & Gamble, n. sp. A climbing shrub (?); branches slender; ultimate branchlets reddish, rusty-villous. *Leaves* entire, chartaceous; elliptic-lanceolate, long acuminate at apex, narrowed at base; glabrous above, grey-pubescent on the nerves beneath and with minute white scales, glandular dots obscure; 4 to 5 in. long, 1·5 to 2 in. broad; midrib very prominent, impressed above; main-nerves about 8 pairs, prominent, slender, curving upwards to and along the margin; reticulations many, prominent on the upper surface; petiole ·2 in. long, pubescent. *Inflorescence* of slender rusty-villous panicles of long racemes, the panicles 7 to 10 in. long, racemes 3 to 6 in.; rachis hirsute, somewhat angular; bracts deciduous, bracteoles very minute, subulate; buds very small, globose. *Calyx-lobes* ovate, rounded, very minute, the edges ciliate with long moniliform hairs, tube very short. *Corolla-lobes* oblong, acute, ·05 in. long, shaggy with long moniliform hairs. *Stamens* shorter than the corolla-lobes; anthers ovate, cordate, with two prominent papillose warts behind at the insertion of the dorsifixed very short filaments. *Ovary* ovoid, style conical. *Berry* not known.

Perak: *Scortechini.*

This interesting species is characterised by the abundant moniliform hairs on the flowers, longer and more conspicuous than in other species.

5. Embelia penangiana, Mez Monog. Myrs. 311 (1901). A climbing shrub, stem reaching about 1 in. in diam.; branches stout; ultimate branchlets red, striate, lenticellate. *Leaves* entire, chartaceous; elliptic, shortly acuminate at apex, narrowly cuneate at base; glabrous, not gland-dotted; 3·5 to 4·5 in. long, 1·5 to 2 in. broad; midrib prominent, impressed above; main-nerves 10 to 12 pairs, irregular, slender, at about two-thirds of a right angle with the midrib at first then arching upwards to join near the margin; secondary nerves similar but less prominent, reticulations many; petiole ·5 in. long, slender, edged by the crispate decurrent margins of the blade which are often connivent above. *Inflorescence* a terminal 3-pinnate leafy panicle, 6 to 9 in. long, of slender racemes; rachis slightly pubescent, main branches at about half a right angle with rachis; peduncles about 1 in. long, upper branches and branchlets usually at right angles; bracts lanceolate spathulate, leafy, deciduous;

bracteoles subulate, as long as or rather longer than the very short, under ·05 in. long pedicels; buds very small, globose, flowers red. *Calyx-lobes* orbicular, glandular-ciliate, ·05 in. long, connate to the middle, not gland-dotted. *Corolla-lobes* 5, free, ovate, rounded at apex, ·075 to ·1 in. long, slightly pubescent without, papillose within, not gland-dotted. *Stamens* of ♂ flowers equal to or longer than the corolla-lobes, of ♀ flowers shorter than them, inserted near the base of the lobes; anthers oblong, emarginate, with minute black warts behind at the insertion of the dorsifixed filaments. *Ovary* ovoid, glabrous, style very short, stigma peltate. *Berry* globose, red, tuberculate and corrugate, ·1 in. in diam., fruiting pedicels as long as berry. *Embelia Ribes* var. *penangiana*, Oliv. in Hook. Ic. Pl. t. 1597.

PENANG: *Curtis* 306. PERAK: *Wray* 1375, 1409; *Scortechini*; *King's Collector* 3637, 10739.

A well-marked species, distinguished by the fairly prominent nerves of the leaves, the very short pedicels, and the absence of glandular dots.

6. EMBELIA PERGAMACEA, A. DC. Prod. VIII. 85 (1844). A slender climbing shrub; branches rather thick, branchlets wrinkled and angular when dry. *Leaves* entire, coriaceous; oblong-lanceolate, acuminate at apex, cuneate or acute at base; glabrous, shining above, pale beneath, margins recurved, glandular dots many, hardly prominent; 3 to 5 in. long, 1·5 to 2 in. broad, midrib thick, impressed above; main-nerves slender 12 to 14 pairs, parallel but irregular, raised and conspicuous on the upper surface, leaving the midrib at about two-thirds of a right angle and joining near the edge in an intramarginal nerve; secondary nerves many, parallel to the main-nerves, reticulations obscure; petiole ·3 in. long, angular, channelled above when dry by the crispate edges of the decurrent blade. *Inflorescence* a large terminal, pyramidal, 4-pinnate, nearly glabrous, leafy panicle with racemose branchlets and very numerous flowers; main rachis thick, flattened above, branches nearly at right angles to rachis as again are the branchlets, all angular; bracts ovate spathulate, leafy, bracteoles subulate acuminate as long as the pedicels; pedicels ·05 in. long, somewhat longer in fruit; buds very small, globose, flowers light red. *Calyx-lobes* minute, about ·04 in. long, broadly triangular, acute, glandular-ciliate, papillose on both sides, dotted with few large and small brown and black glands, tube as long as lobes. *Corolla-lobes* free, ovate-oblong, glandular-ciliate, glabrous without, papillose within, dotted in upper part only, ·07 in. long. *Stamens* as long as or shorter than corolla-lobes, inserted half-way up; anthers ovate cordate, emarginate, black-warted behind at the insertion of the dorsifixed filaments. *Ovary* glabrous, ovoid; style thick very

short; stigma capitate. *Berry* globose, blue when ripe, wrinkled when dry, ·06 in. in diam., crowned with the persistent style, gland-dotted. Miq. Fl. Ind. Bat. II. 1012; Scheff. Myrs. 34; Mez Monog. Myrs. 310. *Ardisia pergamacea*, Bl. *fide* A. DC.

PERAK: *Curtis* 2029; *Wray* 2001; *King's Collector* 3658, 4678, 6412.—DISTRIB. Java; Borneo.

This species closely resembles *E. coriacea*, but differs in the acuminate leaves, very shining above and prominently nerved; in the papillose calyx-lobes, petals dotted only in the upper part and bracteoles as long as the pedicels.

7. EMBELIA CORIACEA, Wall. Cat. 2314 (1829). A climbing shrub; branches reaching 1·5 in. in diam.; branchlets reddish, twisted, somewhat angular, roughly lenticellate. *Leaves* entire, coriaceous; oblong or oblong-lanceolate, obtusely acute at apex, rounded or almost cordate or auricled at base; glabrous, more or less shining above, brownish beneath, glandular dots scattered, not prominent, margin sometimes incurved; 3 to 10 in. long, 1·5 to 4 in. broad; midrib thick, impressed above; main-nerves many, slender, not prominent, irregularly parallel, at about two-thirds of a right angle with the midrib, joining in an intramarginal faint nerve; secondary nerves many, slender, reticulations faint; petiole thick, ·3 to ·7 in. long, channelled when dry by the crispate edges of the decurrent blade. *Inflorescence* a large terminal 4-pinnate spreading leafy rusty-pubescent panicle with racemose branchlets and very numerous flowers; main rachis thick, somewhat flattened, branches nearly at right angles to rachis as again are the branchlets; bracts leafy, decreasing upwards; bracteoles minute, subulate, about half the length of the pedicels; pedicels ·05 in. long; buds very small, globose, flowers grey. *Calyx-lobes* 5, minute, triangular, glabrous, dotted with very few (3 to 5 per lobe) brown or black glands; tube as long as lobes. *Corolla-lobes* free, 4–5, ovate, blunt, recurved, glabrous without, slightly papillose within, gland-dotted all over. *Stamens* shorter than the corolla-lobes, inserted on them about half-way up; anther-cells oblong, somewhat divaricate, with about 4 black warts behind at the insertion of the short filaments. *Ovary* ovoid, style very short, stigma capitellate. *Berry* globose, smooth, ·075 to ·1 in. in diam., pale, prominently gland-dotted, wrinkled when dry, crowned with the persistent base of the style. A. DC. in Trans. Linn. Soc. XVII. 135, Prod. VIII. 87; Clarke in Hook. f. Fl. Br. Ind. III. 513; Mez Monog. Myrs. 313. *E. oblongata*, Miq. Fl. Ind. Bat. Suppl. 573; Scheff. Myrs. 34. *E. macrophylla*, Bl.; Scheff. Myrs. 36.

PENANG: *Wallich* 2314; *Curtis* 1047. PERAK: *Curtis* 1307; *Derry* 11712; *Wray* 2001, 2579, 3238; *Scortechini* 117, 255; *King's Collec-*

tor 2278, 3481, 4976, 5056, 5254, 5323, 6231, 6766, 7857, 10015, 10543. PAHANG: *Ridley* 5828. SELANGOR: *Ridley* 7562. MALACCA: *Maingay* (K.D.) 1018; *Ridley* 11135. SINGAPORE: *Ridley* 2812.—DISTRIB. Sumatra; Java; Borneo, *Beccari* 767, 878, 1189, 2561, 3922; *Haviland & Hose* 3469.

8. EMBELIA ANGULOSA, King & Gamble, n. sp. A climbing shrub; branches thick, branchlets wrinkled when dry, lenticels few. *Leaves* entire, coriaceous; ovate, obtuse, emarginate, glabrous, shining above, dull beneath, glandular dots pitted on both surfaces; 2 to 3·5 in. long, 1 to 2 in. broad; midrib very thick and prominent, impressed above; main-nerves 14 to 16 pairs, slender, irregular, leaving the midrib at nearly a right angle, then curved and joining near the margin, raised on upper surface; secondary nerves many, slender, reticulations obscure; petiole ·2 in. long, channelled above and bordered by the crispate edges of the decurrent blade. *Inflorescence* a dense terminal glabrous stiff panicle about 4 in. long and broad, of racemes, the rachises sharply angled; bracts leaf-like, spathulate, bracteoles very small, subulate; pedicels ·05 in. long, thick, angular, glabrous or minutely pubescent, equal to or shorter than the bracteoles; buds globose. *Calyx-lobes* ovate, ciliate, minute, ·03 in. long, not gland-dotted. *Corolla-lobes* free, ovate, acute, ·075 in. long, nearly glabrous outside, papillose within. *Stamens* shorter than corolla-lobes, inserted one-third up, reniform, with inconspicuous black dots at the insertion of the short dorsifixed filaments. *Ovary* ovoid glabrous; style very short; stigma peltate. *Berry* red, ovoid, somewhat pyriform, ribbed and gland-dotted, glabrous, crowned with the remains of a cylindric style and capitate stigma. *E. coriacea*, Stapf in Trans. Linn. Soc. Ser. ii. IV. 200 (*not of* A. DC.)

PERAK: *Wray* 1524—on Ulu Batang Padang at nearly 5,000 ft.—DISTRIB. Borneo, *Haviland* No. 1152, on Mt. Kinabalu at 7,600 to 8,800 feet.

The description of the flowers is taken from Haviland's Borneo specimen, the rest from Wray's.

9. EMBELIA LAMPANI, Scheff. Myrs. 37 (1867). A slender climbing shrub, clinging to trees; branches reddish-brown, rough with strigose hairs, lenticellate; branchlets rusty-villous-hairy. *Leaves* chartaceous; oblong, obtuse or emarginate at apex, rounded or cordate at base; margins recurved, upper surface glabrous except on the midrib, lower surface rusty-villous, glandular dots many, scattered; 1·5 to 3·5 in. long, 1 to 1·5 in. broad; midrib impressed above, prominent below, villous on both sides; main-nerves many (up to 24 pairs), irregular, at about two-thirds of a right angle with the midrib, straight at first then curving

upwards to meet in a nerve more or less parallel to the margin; secondary nerves similar, reticulations many; petiole ·1 to ·2 in long, rusty-villous. *Inflorescence* of terminal panicles of pedunculate racemes 6 to 12 in. long, the branches often leafy, rachis and peduncles all rusty-villous; peduncles ·5 to ·7 in. long, pedicels slender, about ·05 in. long; bracts few, leaf-like; bracteoles rather longer than the pedicels, lanceolate to spathulate; flowers small, buds globose, petals white, striate, tube red. *Calyx-lobes* 5–6, ovate, acute, ciliate on the edges, villous, dotted with few glands; tube as long as lobes, both together ·05 in. long, longer in fruit. *Corolla* gamopetalous from one-third to one-half of its length; lobes oblong, obtuse, recurved, ·1 in. long, sparsely gland-dotted. *Stamens* as long as or a little shorter than the corolla-lobes, inserted about half-way up, anthers oblong, dehiscing longitudinally, the back with black conspicuous glandular warts; filaments adnate to the corolla below point of insertion, slender, dorsifixed. *Ovary* rounded, glabrous, style cylindric, stigma peltate in ♀, slightly lobed in ♂. *Berry* globose, ·1 to ·15 in. in diam., black when dry, crowned with the persistent style, rugosely glandular. Clarke in Hook. f. Fl. Br. Ind. III. 514. *E. villosa*, Wall. Cat. 2313 (*in part*). *Grenacheria Wallichiana*, Mez Monog. Myrs. 293, fig. 49. *G. Lampani*, Mez l.c. 294.

PENANG: *Curtis* 305; *G. King*. PERAK: *Wray* 95, 2784; *Scortechini* 231; *King's Collector* 2483, 4210, 6849, 8134. SELANGOR: *Ridley* 10224. MALACCA: *Maingay* (K.D.) 1003. SINGAPORE: *Ridley* 10417.—DISTRIB. Sumatra, *Korthals*; Borneo, *Haviland & Hose*.

Haviland and Hose's Borneo specimens have rather larger flowers than, and pedicels about twice as long as, those from the Peninsula (No. 2280).

10. EMBELIA AMENTACEA, Clarke in Hook. f. Fl. Br. Ind. III. 514 (1882). A slender climbing shrub; branches pale brown, velvety; branchlets cinnamomeous or rusty-villous. *Leaves* chartaceous; oblong or obovate-oblong, obtuse and sometimes emarginate at apex, rounded at base; upper surface sparsely pilose, under surface pubescent, pale bluish-green, glandular dots many prominent; 2 to 3 in. long, ·75 to ·1 in. broad; midrib impressed above, prominent below, villous on both sides; main-nerves few, 6 to 10 pairs, irregular, at about two-thirds of a right angle with the midrib, arching upwards, branching and joining in a nerve near the margin; secondary nerves similar but more slender, reticulations not prominent; petiole ·15 in. long, villous, winged by the decurrent base of the blade. *Inflorescence* of terminal panicles of pedunculate racemes, the branches leafy, the leaves passing gradually into oblong or spathulate conspicuous bracts; peduncles 1 to 1·5 in. long, enlarged at base; pedicels ·1 in. long, supported by linear subulate bracteoles twice their

length, so that when in bud the racemes have the appearance of catkins; flowers very small, buds globose. *Calyx-lobes* 5, acute, ciliate on the edges, gland-dotted, tube as long as lobes, both together ·05 in. long. *Corolla* very shortly gamopetalous; lobes 5, ovate, obtuse, glabrous within, ·05 in. long. *Stamens* very short, shorter than corolla-lobes, inserted about half-way up; anthers oblong, rounded, with black papillose warts on the back; filaments as long as anthers, dorsifixed. *Ovary* rounded, glabrous, conical above, style slender, stigma peltate. *Berry* globose, wrinkled when dry, ·1 to ·125 in. in diam., crowned with the persistent style and stigma, black when dry. *Grenacheria amentacea*, Mez Monog. Myrs. 294.

PERAK: *Scortechini* 802; *Ridley* 7172 (*part*); *King's Collector* 5055, 6280, 6817, 8692—in open ground and in bamboo forests. SELANGOR: *Ridley* 7561, *Native Collector* 2802A, *Goodenough* 10555. MALACCA: *Griffith* (K.D.) 3548.

Mez suggests that this may be a young state of *Grenacheria Wallichiana*. He apparently saw only Griffith's specimen. The abundant material now available clearly shows that Clarke correctly considered it as separate. The curious catkin-like young inflorescence and the more sparse leaf-venation distinguish it.

11. EMBELIA RIDLEYI, King & Gamble, n. sp. A climbing (?) shrub; branchlets light brown, wrinkled. *Leaves* chartaceous; oblong, acute at apex, rounded at base; glabrous, glandular dots scattered obscure, margin somewhat recurved; 4 to 7 in. long, 1·5 to 3 in. broad; midrib thick, prominent below; main-nerves prominent below, about 12 pairs, curving upwards and meeting in a looped intramarginal nerve; secondary nerves and reticulations faint; petiole ·5 in. long, thick. *Inflorescence* an axillary panicle of racemes, the branches curved, distant; rachis ·5 to 1 in. long, that of racemes shorter, bracteoles minute, triangular; racemes about ·5 in. long. *Calyx-lobes* 4 or 5, ovate, gland-dotted, very small. *Corolla* and rest not seen.

SINGAPORE: *Ridley* 6324. It seems to come near to *E. floribunda*, Wall.

E. Tsjeriam-Cottam, A. DC. is quoted by Mez as extending from India southwards to Singapore, but we have seen no specimens from our region.

12. EMBELIA MYRTILLUS, Kurz in Journ. As. Soc. Beng. XL. ii. 67 (1871), and For. Fl. II. 104. A small climbing shrub (Wray); branches rough, somewhat corky, with large lenticels; ultimate branchlets densely rusty-villous. *Leaves* coriaceous; bifarious, broadly elliptic to almost orbicular, acute at apex with usually 3 terminal teeth, narrowed truncate or cordate at base; glabrous above, slightly villous on nerves beneath; glandular dots black, numerous, small, fewer large, scattered, especially

near the apex and along the margin, which is often recurved; ·4 to ·7 in. long, ·3 to ·6 in. broad; midrib prominent; main-nerves 6 pairs, arched upwards and joining in an intramarginal nerve; secondary nerves similar, reticulations prominent; petiole ·1 in. long, villous. *Flowers* tetramerous, very small, in umbels or very short racemes on short axillary arrested branches, ·1 to ·15 in. long, shorter than the leaves; bracts minute, subulate. *Calyx-lobes* ovate, glandular ciliate, densely papillose within, ·05 in. long, tube very short. *Corolla-lobes* free, oblong, rounded at apex, ·1 in. long, glandular-ciliate on the edges, conspicuously marked with black, oblong or linear glands. *Stamens* longer than the corolla-lobes in ♂ flowers, shorter in ♀; anthers oblong, often cordate, with conspicuous warts at the insertion of the dorsifixed filaments which spring from the base of the petals. *Ovary* ovoid; style slender; stigma capitate, 4-cleft. *Berry* globose, red or black, ·15 to ·2 in. in. diam., prominently gland-dotted, tipped with the persistent style and stigma. Clarke in Hook. f. Fl. Br. Ind. III. 516; Mez Monog. Myrs. 322. *Myrsine Myrtillus*, Hook. Ic. Pl. t. 825. *Samara Myrtillus*, Kurz in Journ. As. Soc. Beng. XLVI. ii. 223.

PERAK: *Scortechini* 762; *Wray* 1565, 3818, on Gunong Bubu and Gunong Brumber, at 5,000 to 7,000 feet. MALACCA: summit of Mount Ophir, *Griffith* (K.D.) 3542; *Lobb; Ridley*.—DISTRIB. Burma, *Griffith*.

13. EMBELIA PARVIFLORA, Wall. Cat. 2307 (1829). A slender climbing shrub reaching 60 feet in length; branches and branchlets densely rusty-villous, slender. *Leaves* chartaceous; distichous, ovate, obtusely acute at the apex, truncate at base; glabrous except on the midrib beneath; margin slightly recurved; glandular dots many, prominent, scattered, more numerous towards the apex; ·7 to 1·5 in. long, ·5 to ·75 in. broad; midrib prominent beneath, impressed above; main-nerves 8 to 10 pairs, slender, curving upwards towards the margin; secondary nerves slender, many, reticulations prominent; petiole scarcely ·05 in. long, rusty-villous, channelled above. *Inflorescence* of very short axillary few-flowered subumbellate racemes, ♂ 4–6-flowered with ·15 in. long slender pedicels, ♀ 1–3-flowered with ·05 in. slender pedicels; bracts in both minute subulate; flowers pentamerous; buds globose. *Calyx-lobes* oblong, fimbriate-ciliate, ·05 in. long, with few (about 6) large brown glands, glandular-villous without, tube very short, ciliæ moniliform. *Corolla-lobes* ovate, rounded, ciliate, ·075 in. long, ·05 in. broad, with few unequal-sized prominent brown glands. *Stamens* in ♂ flowers longer than corolla-lobes, in ♀ much shorter; anthers reniform, in ♂ apiculate and warted at back at the insertion of the dorsifixed, rather long filaments which spring from near the base of the corolla-lobes. *Ovary*

rounded, glabrous; style slender, curved, stigma peltate, at any rate in ♀. *Berry* globose, red, black when dry, smooth, ·15 to ·2 in. in diam., surmounted by the remains of the style and stigma. A. DC. in Trans. Linn. Soc. XVII. 130 (excl. var. β), Prod. VIII. 86: Scheff. Myrs. 44; Kurz For. Fl. II. 104; Clarke in Hook. f. Fl. Br. Ind. III. 515; Mez Monog. Myrs. 324. *Samara parviflora*, Kurz in Journ. As. Soc. Beng. XLVI. ii. 223. *Celastrinea*, Griff. Itin. Notes 85, n. 1226.

PERAK: *Scortechini; Wray* 4194—at Maxwell's Hill, Larút, 3,500 feet; *Curtis* 2059—on Hijan Range; *King's Collector* 2342, 6992—from dense forests on high hills at 3,000 to 5,000 feet.—DISTRIB. Khasia and Naga Hills; Upper Burma, *Griffith* (K.D.) 3545, &c.; Sumatra.

IMPERFECTLY KNOWN SPECIES.

14. **EMBELIA LUCIDA**, Wall. Cat. 2315. *Leaves* 3 in. long, 1·25 in. broad, broadly oblong, suddenly narrowed at both ends, entire, glabrous, coriaceous. *Racemes* 1 in. long, axillary, simple, solitary or paired, rusty-villous. A. DC. Trans. Linn. Soc. XVII. 134, Prod. VIII. 87; Clarke in Hook. f. Fl. Br. Ind. III. 517; Mez Monog. Myrs. 396.

SINGAPORE: *Wallich* 2315.

15. **EMBELIA MACROCARPA**, King & Gamble, n. sp. A strong climber, branchlets thick, nearly black, rough. *Leaves* coriaceous; elliptic, obtuse or shortly acuminate at apex, almost rounded at base, glabrous, margin reflexed; 6 in. long, 3 to 4 in. broad; midrib rather slender; main-nerves irregular, distant, not prominent, about 8 pairs; secondary nerves slender, obscure as are the reticulations; petiole ·7 to 1 in. long, thick, bordered above by the decurrent margins of the leaves. *Flowers* apparently on rather short, thick racemes from the branches. *Calyx-lobes* 4, triangular, acute, gland-dotted, under ·1 in. long. *Berry* large, ·5 to ·7 in. in diam., smooth, wrinkled when dry, globose, crowned with the short remains of the persistent style. *Seed* with many conspicuous pits. Rest not seen.

PENANG: at Marriot's Road, 1,500 feet, *Curtis* 1229.

The following Burmese species is here inserted, as it is found in Tenasserim and may occur further south in the Malay Peninsula.

EMBELIA GALLATLYI, King & Gamble, n. sp. Apparently a shrub; branchlets rounded, dark brown, lenticellate. *Leaves* ovate, acuminate at apex, truncate at base; prominently crenate dentate with blunt teeth and glands in the crenatures; glabrous on both surfaces, glandular dots few, chiefly near the margin; 1 to 1·4 in. long, ·5 to ·7 in. broad; midrib slender, impressed above; main-nerves 10 to 12 pairs; arching upwards to the crenatures; secondary nerves many, slender, reticulations prominent; petiole ·1 to ·2 in. long, channelled above, crispately edged. *Inflorescence* of axillary corymbose racemes, 10–12-flowered, rachis about 2 in. long, bracts minute subulate, the whole minutely rusty-pubescent, pedicels slender. *Calyx-lobes* triangular acute ·03 to ·05 in. long, ciliate; tube as long as lobes or somewhat shorter. *Corolla-lobes* oblong-spathulate, ·1 in. long, ciliate, minutely pubescent, sparsely gland-dotted. *Stamens* longer than corolla-lobes, ·15 in., anthers oblong, cells parallel, not warted behind at the insertion of the long exsert filaments which spring from close to the base of the corolla-lobes. *Ovary* ovoid-conical, style short curved, stigma minute. *Berry* unknown.

TENASSERIM: at Moolyet, 5,000 feet, *G. Gallatly* No. 407. *Gamble* No. 7906 from Mianimukh, Chittagong Hill Tracts, without flowers or fruit, is probably this species.

4. LABISIA, Lindl.

Small shrubs, with a creeping rhizome and erect stem, resembling *Pothos* in appearance. *Leaves* few, coriaceous, entire or denticulate, sessile or petiolate, the petiole often dilated, main leaf-nerves very many, at right angles to the midrib. *Flowers* hermaphrodite, minute, pink, in axillary spike-like panicles, bracts very small. *Calyx* minute, 5-lobed. *Corolla* 5-lobed, lobes ovate, induplicato-valvate in bud; tube very short. *Stamens* 5, wrapped in the corolla-lobes; filaments very short; anthers ovoid, introrsely dehiscent, no staminodes. *Ovary* globose, attenuated into a short style; stigma small; ovules few, immersed in a globose central placenta. *Fruit* small, globose, red, 1-seeded. *Seed* globose, hollowed at the base; albumen smooth; embryo cylindric transverse. —DISTRIB. About 4 species, all of the Malay Peninsula and Archipelago.

Leaves petiolate without decurrent wings :—	
Leaf-blades elliptic-lanceolate, much longer than broad	1. *L. pumila* var. *lanceolata*.
Leaf-blades ovate or ovate-orbicular, nearly as broad as long	2. *L. paucifolia*.
Leaves with winged petioles or sessile :—	
Wings very narrow, blade of leaf acuminate at both ends	1. *L. pumila*.
Wings broad :—	
Leaves crenate, thin, main-nerves rather distant ..	1. *L. pumila*, var. *alata*.
Leaves entire, coriaceous, main-nerves very close and regular	3 *L. longistyla*.

1. LABISIA PUMILA, Benth. & Hook. f. Gen. Pl. II. 645 (1876). A semi-herbaceous undershrub, with rooting stems and leaves not jointed at their insertion but decurrent into them. *Leaves* bluish-green, elliptic-lanceolate, acuminate, narrowed at the base, and more or less decurrent on the petiole; crenately toothed, or sometimes nearly entire; blade 5 to 8 in. long by 1 to 2·5 in. broad; midrib thick, often rusty-pubescent; main-nerves extremely numerous, nearly at right angles to the midrib, parallel, slender, anastomosing towards the margin, and

then producing an elegant network; under-surface with brown glandular scales; petiole 1 to 3 in., enlarged at the base, often minutely rusty-pubescent. *Flowers* pink, in a spike-like, long-stalked, ferruginous-tomentose panicle of small corymbose bracteate clusters; peduncles of corymbs 1 in. long or shorter, sometimes none; bract linear-subulate, ·05 to 1 in. long.; pedicels ·05 to 1 in., slender, with minute bracteoles. *Calyx-lobes* triangular, acute, ·025 in. long, densely glandular. *Corolla-lobes* ovate, with linear glands, glabrous. *Stamens* infolded in the corolla; filaments very short; anthers oblong-linear, apiculate, with several hard round or linear black warts on the back. *Ovary* rounded, pubescent, ending in a subulate angular style with minute notched stigma. *Fruit* a globose red berry, about ·15 in. in diam., ribbed and with prominent elongate glands, surmounted by the persistent style. Mez Monog. Myrs. 171 (var. *genuina*). *L. pothoina*, Lindl. in Bot. Reg. 31. t. 48; Clarke in Hook. f. Fl. Br. Ind. III. 518; Stapf in Trans. Linn. Soc. Ser. 2, IV. 200; *Ardisia pumila*, Blume Bijdr. 688; A. DC. Prod. VIII. 137; Miq. Pl. Jungh. 199 and Fl. Ind. Bat. II. 1028; Scheff. Myrs. 92. *A ? spicata*, Wall. Cat. 2273; A. DC. in Trans. Linn. Soc. XVII. 135.

SINGAPORE OR PENANG: *Walker*, 165. PENANG: *Curtis* 1192; *Kunstler* 1159. PERAK: *Scortechini*; *Wray* 753A. MALACCA: *Maingay* 1013 (K.D.); *Stoliczka*. SINGAPORE: *Ridley* 1804.—DISTRIB. JAVA: *Forbes* 238, 474. In dense moist forests on the lower slopes of hills.

VAR. *lanceolata*, Scheff. l.c. 93. *Leaves* elliptic-lanceolate, acuminate, somewhat rounded at base; not, or very slightly, decurrent; blade 5 to 8 in. long, by 1·5 to 3·5 in. broad; petiole 2 to 5 in. long not winged. *Inflorescence* more slender, bracts often longer than the peduncle of the corymb. Clarke in Hook. f. Fl. Br. Ind. III. 518; Mez Monog. Myrs. 172. *L. pothoina*, N. E. Brown (*non* Lindl.) in Ill. Hort. XXXII. 95 tab. 561.

PENANG: *Hullett* 201. PAHANG: *Goodenough* 2799. SINGAPORE: *Lobb* 61; *Kurz*; *T. Anderson* 196.—DISTRIB. Sumatra, *Korthals*; Borneo, *Motley* 1250, *Haviland*.

VAR. *alata*, Scheff. l.c. 93. *Leaves* thin ashy-green above, dark green below, elliptic oblong, rounded at top or obtusely acuminate; gradually or suddenly narrowed into a broad wing decurrent on the petiole; crenate glands and scales few or none; 6 to 16 in. long, 2 to 4 in. broad. *Inflorescence* with the corymbs usually more closely congested and on a shorter peduncle; flowers somewhat smaller, bracts usually longer than the corymb peduncle, flowers white or pink. Mez Monog. Myrs. 172. *L. alata*, N. E. Brown in Ill. Hort. XXXIII. 123, t. 605.

PERAK: *Wray* 753B, 824, 2482, 2737; *Scortechini*; *King's Collector*

980, 2815, 2882, 2891, 2942, 2974, 2999, 3376, 8325, 10949. SINGAPORE: *Lobb* 313.—DISTRIB. Sumatra, *Korthals*; Borneo.

2. LABISIA PAUCIFOLIA, King & Gamble, n. sp. A small semi-herbaceous undershrub, 10 to 15 in. high; the stems striate, round, minutely purplish-brown-pubescent, bearing rarely more than 3 to 4 leaves. *Leaves* long-petioled, the blade ovate or orbicular-ovate, rounded at top into a bluntly acute point, rounded at base and then very shortly decurrent; entire or very minutely crenate; 2·5 to 4 in. long, 1·5 to 3in. broad; main-nerves slender, numerous, more or less parallel, joining near the edge; petiole 1 to 2 in. long, thickened at the base and decurrent into the stem. *Inflorescence* 1·5 to 2·5 in. long, consisting of axillary, short-peduncled, rusty-pubescent racemes, the flowers reflexed, single or in few-flowered sessile clusters; pedicels ·05 to ·1 in. long, with short subulate bracts of equal length. *Calyx-lobes* ovate-acuminate, covered without with numerous glands, ·075 in. long; tube short, about half the length of lobes. *Corolla-lobes* oblong-acuminate, ·125 in. long, glabrous. *Stamens* closely enfolded; filaments very short; anthers hastate, long apiculate, glandular warted behind, ·1 in. long. *Ovary* rounded, pubescent; style about ·04 in. long, angular, oblique; stigma minute, notched. *Fruit* a dark red berry, ·1 in. in diam., striate and with oblong glands.

PERAK: *Scortechini*; *Wray* 4102; *King's Collector* 8078. In open forest at 3,000 to 5,000 feet.

Besides the characteristic leaves, the acuminate petals and hastate long apiculate anthers make this species recognisable, though the leaf-venation resembles that of *L. pumila*.

3. LABISIA LONGISTYLA, King & Gamble, n. sp. An undershrub about 2 feet high; stem thick, rusty-brown, minutely pubescent. *Leaves* sessile, oblong, entire, rounded at apex and very slightly emarginate, decurrent below in a broad wing for about ⅙ of their length; prominently glandular-pitted above and with rusty glandular scales below; 7 to 12 in. long, 3 to 4 in. broad; midrib very thick, prominent, glandular scaly; main-nerves at right angles to midrib, extremely numerous, straight, parallel, anastomosing towards the edge which is slightly recurved. *Inflorescence* a raceme-like rusty-pubescent panicle of single flowers or shortly peduncled few-flowered secund corymbs, 8 to 9 in. long, the main peduncle about 4 in.; corymb-peduncles curved, angled, ·3 to ·4 in. long; bracts very short, subulate; pedicels striate, about ·15 in. long; bracteoles minute. *Calyx-lobes* ovate, acute, glandular without, tube rather shorter than lobes, together ·06 in. long. *Corolla* and *stamens* unknown. *Ovary* rounded, pubescent, crowned by a

filiform ·2 in. long style. *Fruit* a globose berry, with a conical top and the remains of the style, glabrous, striate with linear-oblong prominent glands.

PERAK: *Wray* 1590. SELANGOR: *Curtis* 3750, at 3,000 to 4,000 feet.

5. ARDISIA, Swartz.

Small trees, shrubs or semi-herbaceous undershrubs, evergreen, generally all parts with pellucid glands which often dry black. *Leaves* sessile or petiolate, membranous to coriaceous, entire crenate or serrate. *Flowers* regular, pedicellate, hermaphrodite; inflorescence various. *Calyx* inferior, 4–6-lobed, the lobes free or overlapping to the right; tube very open, as long as or shorter than the lobes. *Corolla* red white or spotted, often waxy in appearance, 4–6-lobed, the tube often very short; the lobes overlapping to the right, often twisted. *Stamens* equal in number to, and opposite to, the corolla-lobes, sometimes long and narrow, usually sagittate-lanceolate and apiculate, sometimes very small, fixed to the corolla-tube by filaments usually short and broad; generally opening by slits, occasionally by terminal pores, in *A. littoralis* septate; dehiscence always introrse. *Ovary* globose, sometimes narrowed into the style, more often almost depressed; style usually filiform, rather long; stigma punctiform; ovules few or many, immersed in a globose placenta. *Fruit* a globose, rarely obovoid, berry, usually surmounted by the remains of the style, fleshy, red or purple or black, often spotted; endocarp crustaceous; 1-seeded. *Seed* solitary, large, globose, hollowed at the base; albumen pitted or ruminate; embryo cylindric horizontal.—DISTRIB. 200 to 250 species, all of tropical or sub-tropical regions in both worlds, scarce in Africa.

Leaves entire or crenate, never serrate:—
Leaves entire, or if crenate without glands in the crenatures:—
Calyx-lobes not, or only slightly, overlapping to the right, usually small:—
Inflorescence lateral:—
Inflorescence short-peduncled, shorter than the leaves (I. PIMELANDRA):—
Leaves entire; inflorescence on wood of current and past years:—
Leaves over 6 in. long; nerves conspicuous:—
Leaves nearly glabrous beneath; main-nerves less than 20 .. 1. *A. pachysandra.*
Leaves densely tomentose beneath; main-nerves more than 20 .. 2. *A. Teysmanniana.*

Leaves under 6 in. long :—

Leaves shining, nerves obscure; flower-buds very short, rounded .. 3. *A. chrysophyllifolia.*

Leaves not shining, nerves conspicuous; flower-buds long, acuminate 4. *A. solanoides.*

Leaves crenate; inflorescence on wood of current year .. .. .. 5. *A. fulva.*

Inflorescence long-peduncled (II. Akosmos):—

Peduncles slender, under 1 in. long, pubescent; leaves membranous .. 6. *A. ferruginea.*

Peduncles thick, 3 to 3·5 in. long, glabrous; leaves coriaceous.. .. .. 7. *A. lankawiensis.*

Inflorescence terminal :—

Style exsert in the bud (III. Stylardisia) :—

Leaves membranous; inflorescence short, few-flowered .. .. .. 8. *A. andamanica.*

Leaves chartaceous or coriaceous, inflorescence elongate, many-flowered :—

Leaves without a conspicuous intramarginal nerve :—

Calyx-lobes ·05 in. long or under, usually glabrous :—

Leaves coriaceous :—

Leaves not thickly scaly beneath :—

Nerves of leaves obscure, leaves dark when dry .. .. 9. *A. tuberculata.*

Nerves of leaves prominent, leaves pale when dry .. 10. *A. ophirensis.*

Leaves thickly scaly beneath :—

Leaves broad; main-nerves very many, prominent, over 24 pairs 11. *A. labisiæfolia.*

Leaves narrow; main-nerves fewer, obscure, 20 pairs .. 12. *A. montana.*

Leaves chartaceous :—

Panicles slender, elongate; leaves usually small, main-nerves at about 60° to midrib .. 13. *A. sinuata.*

Panicles rather thick, compact; leaves generally large, main-nerves at about 75° to midrib .. 14. *A. colorata.*

Calyx-lobes ·2 in. long, ferruginous pubescent .. .. .. 15. *A. crassa.*

Leaves with a conspicuous intramarginal nerve .. .. .. 16. *A. platyclada.*

Style not exsert in the bud (IV. Acrardisia) :—

Branches of the inflorescence racemose; buds long, slender .. .. 17. *A. porosa.*

Branches of the inflorescence umbellate; buds short, conical .. .. 18. *A. divergens.*

Calyx-lobes clearly overlapping to the right, usually large and broad :—

Inflorescence terminal (V. Tinopsis) :—

Leaves under 6 in. long; panicle compact, pedicels slender, flowers rather small; berry globose, ·2 in. in diam. .. .. 19. *A. sumatrana.*

Leaves usually over 6 in. long; panicle spreading, pedicels stout, flowers large; berry depressed, over ·25 in. in diam. .. 20. *A. lanceolata.*

Inflorescence lateral (VI. TINUS):—

Anthers septate; leaves coriaceous, obovate, inflorescence short .. .. .. 21. *A. littoralis.*

Anthers not septate:—

Leaves usually over 6 in. long:—

Leaves 8 to 15 in. long, elliptic, buds ·25 in. long .. .. .. 22. *A. Kunstleri.*

Leaves 5 to 10 in. long:—

Main-nerves at about an angle of 60° with midrib:—

Buds ·4 in. long or more; leaves coriaceous:—

Buds conical; calyx-lobes rounded; raceme glabrous .. 23. *A. solanacea.*

Buds rounded; calyx-lobes emarginate, raceme rusty-pubescent 24. *A. lurida.*

Buds ·3 in. long only, rounded; leaves chartaceous .. .. 25. *A. oxyphylla.*

Main-nerves at only about 30° with the midrib; calyx-lobes emarginate 26. *A. Scortechinii.*

Leaves usually under 6 or even 5 in. long:—

Leaves few-nerved; inflorescence long, racemose .. .. .. 27. *A. pendula.*

Leaves many-nerved; inflorescence short, 1–5-flowered .. .. 28. *A. Hullettii.*

Anthers not known; leaves 7 to 10 in. long, under 2·5 in. broad; main-nerves at an angle of 80° with midrib in an elegant network with secondary nerves and reticulations .. 29. *A. oblongifolia.*

Anthers not known; leaves elliptic or elliptic-ovate, acuminate, 4·5 to 6·5 in. long; calyx-lobes 4; inflorescence apparently terminal.. 30. *A. tetrasepala.*

Anthers not known; leaves 3 to 5 in. long, under 1·5 in. broad, acuminate, flowers 2 .. 31. *A. biflora.*

Anthers not known; leaves 4 to 6 in. long, ·7 to ·9 in. broad, linear-lanceolate; flowers in peduncled axillary umbellate racemes, about 5 to 8 .. .. .. 32. *A. tahanica.*

Leaves crenate, with glands in the crenatures (VII. CRISPARDISIA):—

Calyx-lobes more or less gland-dotted:—

Calyx-lobes oblong, obtuse or obtusely acute:—

Calyx-lobes lingulate, over ·25 in. long, sparsely dotted; inflorescence short; leaves lanceolate, more or less villous.. .. 33. *A. villosa.*

Calyx-lobes under ·1 in. long, prominently dotted; inflorescence long; leaves oblong, glabrous, pale .. .. .. 34. *A. virens.*

Calyx-lobes ovate, more or less acute:—

Inflorescence axillary, racemose or umbellate:—

Racemes or umbels in the axils of upper leaves only:—

Leaves over 5 in. long, crenatures broad, very shallow, rounded:—

Leaves membranous, pedicels slender 35. *A. Wrayi.*

Leaves coriaceous, pedicels thick .. 36. *A. minor.*

Leaves under 4 in. long, crenatures narrow, almost dentate .. .. 37. *A. perakensis.*

Racemes in the axils of all or nearly all the leaves, crenatures narrow .. 38. *A. Meziana.*

Inflorescence terminal or pseudo-terminal:—

Inflorescence of a single sessile, umbellate raceme; leaves 4 to 8 in. long .. 39. *A. Ridleyi.*

Inflorescence usually of panicled racemes; leaves 2 to 4 in. long .. .. 40. *A. crenata.*

Calyx-lobes not gland-dotted; inflorescence terminal or pseudo-terminal:—

Branches of inflorescence short, not more than 1 in. long; leaves 2 to 4 in. long .. 41. *A. rosea.*

Branches of inflorescence 2 to 3 in. long; leaves 4 to 6 in. long .. .. 42. *A. longepedunculata.*

Leaves acutely and prominently serrate occasionally abortive (VIII. BLADHIA):—

Inflorescence long, reaching 6 to 8 in.; leaves large, nearly or quite sessile .. .. 43. *A. Maingayi.*

Inflorescence short, under 2·5 in.; leaves petioled:—

Inflorescence 1·5 to 2·5 in. long; anthers mucronate; leaves under 3 in. long .. 44. *A. theæfolia.*

Inflorescence under 1·5 in. long; anthers emarginate; leaves over 4 in. long:—

Leaves and branchlets fulvous-villous; flowers pink; ovary and base of style pubescent .. .. .. 45. *A. odontophylla* var. *Lobbii.*

Leaves and branchlets glabrous; flowers white; ovary and base of style glabrous .. 46. *A. bambusetorum.*

1. ARDISIA PACHYSANDRA, Mez Monog. Myrs. 97 fig. 14 A–E (1901). A large shrub or small tree reaching to 40 to 50 feet high, and 6 to 10 in. diam.; branches with pale brown bark, marked with decurrent lines below the leaves or leaf-scars; branchlets thickly rusty-villous at the ends. *Leaves* membranous; oblong or slightly obovate, acute at apex, cuneate at base; glabrous above, except on the midrib which is sometimes minutely pubescent, glabrous or slightly pubescent beneath; entire, glands numerous near the margins; 6 to 10 in. long, 1·5 to 3 in. broad; midrib thick, slightly impressed above; main-nerves

14 to 20 pairs, irregular, ·4 to ·5 in. apart, starting at an angle of about 60°, then slightly arching to and along the margin; petiole ·4 to ·6 in. long, pubescent, wrinkled, slightly channelled above. *Inflorescence* of small, axillary, sessile or shortly peduncled, umbels or corymbs; peduncles ·1 in. long, flowers 6 to 8; pedicels slender, pubescent, striate, ·4 in. long; bracts minute, subulate, densely pubescent, deciduous. *Calyx-lobes* ovate, rounded, pubescent, ·2 in. long, slightly overlapping to the right, ciliate, gland-dotted especially near the tip. *Corolla-lobes* boat-shaped, broadly ovate, shortly acuminate, ·3 in. long, glabrous, white, faintly nerved, dots very few, revolute in flower; tube short. *Stamens* a little shorter than corolla-lobes; anthers ovate, cuspidate-acuminate, much gland-dotted and warted at the back on the connective; filaments thick. *Ovary* rounded, glabrous, style subulate, as long as the anthers. *Berry* ·2 to ·4 in. in diam., globose, glabrous, pale. *Myrsine pachysandra*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 297; Wall. Cat. 2284; A. DC. in Trans. Linn. Soc. XVII. 111. *Pimelandra Wallichii*, A. DC. in Ann. Sc. Nat. 2. XVI. 88; Prod. VIII. 106; Deless. Ic. Sel. V. 14. t. 31; Scheff. Myrs. 94; Miq. Fl. Ind. Bat. II. 1029; Clarke in Hook. f. Fl. Br. Ind. III. 531.

PENANG: *Wallich* 2284; *Porter*; *Curtis* 1156, 3164, 3181, 3737. MALACCA: *Griffith* (K.D.) 3597; *Maingay* (K.D.) 1006. PERAK: *Wray* 1358; *King's Collector* 5995, 7194.—DISTRIB. Borneo (?).

2. ARDISIA TEYSMANNIANA, Scheff. in Tijdschr. Ned. Ind. XXXI. 368 and in Flora 253 (1870). A large shrub or small tree; branchlets brown, with wavy longitudinal lines passing downwards from the sides of the bases of the petioles, lenticels numerous, innovations densely ferruginous-pubescent. *Leaves* entire, chartaceous; oblong or slightly obovate-oblong or oblong-lanceolate, acuminate at the apex, alternate and sometimes abruptly rounded at base; glabrous above, densely ferruginous-tomentose beneath; glands very numerous, small, evenly distributed over the whole under surface; 6 to 11 in. long, 1·5 to 3 in. broad; midrib thick, prominent beneath; main-nerves 25 to 30 pairs, ·3 to ·4 in. apart, starting at an angle of 60°, at first straight, then curving to meet in the margin in a looped nerve, raised beneath as are the few secondary nerves and the many oblique reticulations; petiole very thick, ·5 to ·6 in. long, usually bordered by the decurrent margins of the blade which are again revolute. *Inflorescence* of axillary pedunculate umbels or corymbs; peduncles in flower ·1 to ·2 in. long, in fruit sometimes up to ·5 in., 4–5-flowered; pedicels slender, ·4 in. long, densely rusty-pubescent, striate; bracteoles linear-subulate, deciduous. *Calyx-lobes* ovate, rounded, pubescent, ·1 in. long, ciliate. *Corolla-lobes* ovate-acuminate, ·2 in. long, softly

pubescent, glands inconspicuous, tube very short. *Stamens* nearly as long as corolla-lobes; anthers ovate, cuspidate-acuminate, concave and warted on the connective at the back, ·175 in. long; filaments slender, ·05 in. long, glabrous. *Ovary* rounded, glabrous; style slender, subulate, as long as stamens. *Berry* globose, slightly depressed, ·3 in. in diam., black-gland-dotted, faintly ribbed. Mez in Monog. Myrs. 97. *Pimelandra Teysmanniana*, Hook. f. in Benth. & Hook. f. Gen. Pl. II. 64. *Pimelandra Wallichii* var. *Teysmanniana*, Clarke in Hook. f. Fl. Br. Ind. III. 531.

MALACCA: *Maingay* (K.D.) 1007. SINGAPORE: *Cantley*; *Ridley* 2800, 5573, 6788.—DISTRIB. Bangka.

This species is easily distinguished from the former by having many more and much closer nerves to the leaves, and by the dense rusty tomentum.

3. ARDISIA CHRYSOPHYLLIFOLIA, King & Gamble, n. sp. A tree, branchlets reddish-brown, innovations densely ferruginous-pubescent. *Leaves* entire, coriaceous; oblong-lanceolate, obtusely acute at apex, narrowed at base; glabrous on both surfaces; glands scattered, visible on the under surface; 4 to 6 in. long, ·75 to 1·25 in. broad; midrib thick, prominent; main-nerves many, more or less parallel, inconspicuous, meeting, with the secondary nerves, in a wavy intramarginal nerve, reticulations fine; petiole ·4 to ·5 in. long, glabrous, channelled above and edged by the decurrent margin of the blade. *Inflorescence* of small, axillary, sessile or shortly peduncled, umbels of up to about 12 flowers; pedicels slender, ·2 in. long, ferruginous-pubescent; bracts minute, triangular; buds very short, rounded. *Calyx-lobes* 5, ovate, minutely ciliate, pubescent and scaly outside, dotted with many conspicuous golden glands, ·05 in. long, tube a little shorter. *Corolla-lobes* ovate, concave, sparsely glandular, glabrous, ·08 in. long; tube none or very short. *Stamens* a little shorter than the corolla-lobes; anthers ovate acuminate, black-gland-dotted behind; filaments short. *Ovary* rounded, glabrous; style subulate, ·05 in. long. *Berry* globose, somewhat depressed, covered with round and elongate glands, ·15 in. in diam.

PERAK: at Lower Camp, Gunong Pateh, 3,400 feet, *Wray* 483, 1118, 1182.

4. ARDISIA SOLANOIDES, King & Gamble, n. sp. A small shrub, 3 to 4 feet high; branches slender, smooth, dark brown; branchlets glandular-hirsute, marked by obscure raised lines from the sides of the bases of the petioles. *Leaves* entire, membranous; elliptic, bluntly long caudate-acuminate at apex, attenuate at base; glabrous above, more or less glandular-hirsute beneath; glandular dots many, scattered, prominent; 2·5 to 3·5 in. long, ·75 to 1·25 in. broad; midrib slender,

raised beneath; main-nerves 8 to 9 pairs, raised, at an angle of 60° with the midrib, the lowest pair more oblique, nearly straight, meeting at about two-thirds of the way to the margin in a looped intramarginal raised nerve, reticulations obscure; petiole ·15 in. long, bordered by the decurrent margins of the blade. *Inflorescence* of sessile, axillary, umbellate, nearly glabrous racemes of about 4 to 6 flowers, racemes hardly ·1 in. long; bracteoles oblong-lanceolate, gland-dotted, ·1 in. long; pedicels slender, ·3 to ·4 in. long, slightly clavate; buds conical, acuminate, ·3 in. long; flowers white with a blueish tinge. *Calyx-lobes* 4 to 5, very short, rounded, scarious and ciliate on the margins, gland-dotted. *Corolla-lobes* ovate below, caudate-acuminate above, twisted and reflexed in flower, ·3 in. long, sparsely pale-glandular-punctate. *Stamens* nearly as long as corolla-lobes, lanceolate, membranous at tip, with two lines of glandular dots on the back of the connective. *Ovary* rounded; style very slender, as long as stamens. *Berry* bright red, glossy, ·25 in. in diam. when dry.

PERAK: in dense jungle on rich soil, at 500 to 800 feet, *King's Collector* 4254.

This species very closely resembles *Antistrophe caudata*, but is at once distinguished by the fact of the corolla-lobes overlapping to the right instead of to the left. The flowers somewhat resemble those of *Ardisia porosa*.

5. ARDISIA FULVA, King & Gamble, n. sp. Apparently a shrub; branchlets rather thick, usually marked by raised lines descending from the bases of the leaves; innovations densely tawny-villous; leaf-buds lanceolate, densely pubescent. *Leaves* coriaceous; elliptic-oblong or elliptic-lanceolate, shortly acuminate at apex, somewhat rounded at base; glabrous or slightly scaly above, thickly tawny-villous beneath; glandular dots few, scattered, obscure, in the areoles of the minor nerves; crenate, especially in the upper two-thirds; 4 to 7 in. long, 1 to 2 in. broad; midrib slender; main-nerves 20 to 24 pairs, irregular, arching upwards and joining in an intramarginal nerve; secondary nerves slender, faint, reticulations curved; petiole ·4 to ·6 in. long, winged by the decurrent edges of the blade. *Inflorescence* of short 1 to 1·5 in. long, densely tawny-pubescent, drooping, corymbs in the axils of tawny, leaf-like, often nearly 1 in. long, bracts from the young branches below the end leaves; peduncles about ·7 in. long, slender, pedicels slender, up to ·5 in. long; bracteoles subulate, short, tawny; buds ovate, ·2 to ·25 in. long. *Calyx-lobes* ovate, thin, villous without, ciliate, ·1 to ·15 in. long, marked with prominent black dots, recurved in flower; tube short. *Corolla-lobes* obovate, obtuse, ·2 to ·25 in. long, oblique, unequal, marked by prominent round or oblong black dots, tube short. *Stamens*

a little shorter than the corolla-lobes, acuminate, with 2 rows of prominent black dots behind the anthers; filaments short. *Ovary* ovoid, surmounted by a short, ·1 in. long, subulate style, glabrous. *Berry* ·2 in. in diam., black when dry, ribbed.

KEDAH: on Langkawi Island, *Curtis* 2133. PENANG: *Ridley* 10216. PERAK: *Ridley* 8269.

6. ARDISIA FERRUGINEA, Mez Monog. Myrs. 108 (1901). A shrub (?); branchlets slender, densely ferruginous-tomentose. *Leaves* membranous; linear- or oblong-lanceolate, bluntly acute at apex, rounded at base; glabrous or slightly rusty-scaly above, rusty-pubescent beneath; entire; glands not apparent; 3 to 4·5 in. long, ·75 to 1 in. broad; midrib slender, nerves very faint; petiole ·1 to ·2 in. long, rusty-pubescent. *Stipules* small, linear-falcate. *Flowers* in densely ferruginous-pubescent, bipinnate panicles in the axils of upper leaves; peduncles ·5 to ·75 in. long; bracts linear subulate about ·15 in.; pedicels slender, ·1 to ·2 in. long; bracteoles minute; buds conical. *Calyx-lobes* ovate, obtuse, ciliate, connate to rather over one-third, with wavy glandular dots. *Corolla-lobes* shortly connate at the base, broadly and obliquely ovate, short acuminate, gland-dotted. *Stamens* a little shorter than the corolla-lobes; anthers large, ovate, gradually acute, scarcely punctate; filaments very short. *Ovary* ovoid, glabrous, style slender.

JOHORE: at Kampong Sunpai, *Lake* & *Kelsall* (*Ridley* 4032).

This species does not seem to differ very much from *A. Miqueliana*, Scheff. in Tijdsch. Ned. Ind. XXXI. 367, in respect to leaves, but that species has terminal and not axillary flowers.

7. ARDISIA LANKAWIENSIS, King & Gamble, n. sp. A tree; branchlets smooth, glabrous, obscurely striate, with raised lines from the edges of the bases of the leaf-petioles. *Leaves* coriaceous; elliptic or elliptic-lanceolate, acuminate at apex, acute at base, glabrous; entire; glandular dots frequent near the margins; 3·5 to 5 in. long, 1·25 to 1·5 in. broad; midrib slender; main-nerves obscure, about 12 to 14 pairs, anastomosing near the margin, secondary nerves and reticulations similar; petiole ·5 to ·6 in. long, channelled above by the decurrent margins of the blade. *Flowers* pink, in long-peduncled, closely congested racemes in the axils of the uppermost leaves; peduncles 3 to 3·5 in. long, flattened, glabrous; pedicels ·5 to ·7 in. long, striate, slender; bracteoles minute, caducous. *Calyx-lobes* ovate, acute, ciliate, with many glands on the back, ·075 in. long. *Corolla-lobes* ovate, acuminate, much gland-dotted, ·25 to ·3 in. long. *Stamens* a little shorter than the corolla-lobes, ovate-lanceolate, mucronate, dehiscing on the margins but more widely near the top. *Ovary* rounded, obscurely 5-lobed; style ·2 in. long, twisted and

wrinkled. *Fruit* a depressed, obscurely 5-angled berry, ·2 in. in diam., pericarp very smooth inside.

KEDAH: on Lankawi Island, *Ridley* 8313.

8. ARDISIA ANDAMANICA, Kurz For. Fl. II. 108 (1877) and in Journ. As. Soc. Beng. XLVI. ii. 225. A small or medium-sized evergreen shrub reaching 15 feet high and 2 in. in diam.; branches slender with reddish-brown bark, striate when dry, branchlets glabrous. *Leaves* entire, membranous; oblong lanceolate, narrowly long acuminate at apex, cuneate at base; glabrous on both surfaces but with many scattered glandular dots and occasional peltate scales; 3 to 6 in. long, ·75 to 1 ·75 in. broad; midrib slender; main-nerves about 20 pairs, very thin and inconspicuous, at about 60° with the midrib, at first straight then arching upwards to and along the margin; petiole ·3 to ·5 in. long, channelled above. *Inflorescence* a loose terminal panicle 2 to 3 in. long, with few slender umbel-like racemes on ·3 to ·5 in. long, squarrose peduncles; pedicels slender, ·3 in.; bracteoles small, ovate, deciduous. *Calyx-lobes* acute, triangular, ·05 in. long, minutely ciliate at the edges, dotted with black glands; tube rather shorter than lobes. *Corolla-lobes* ovate, acute, ·15 in. long, glabrous, with inconspicuous nerves and few scattered round or oblong glands. *Stamens* a little shorter than corolla-lobes; anthers ovate, apiculate, ·1 in. long, glabrous on the back or with few black glands; filaments ·05 in. *Ovary* rounded, glabrous; style filiform, long exsert, ·15 in. long. *Berry* round or slightly pyriform, smooth, ·3 in. in diam. Clarke in Hook. f. Fl. Br. Ind. III. 521; Mez Monog. Myrs. 110. *Ardisia neriifolia*, A. DC. Prod. VIII. 127 *in part* (*not of* Wall.), Trans. Linn. Soc. XVII. t. 8 (*fig. only*).

MALACCA: *Griffith* (K.D.) 3570; *Hullett* 830; *Stoliczka*. PERAK: *Ridley* 9718; *Wray* 867, 943, 971, 1033; *King's Collector* 5692, 8064. JOHORE: *Ridley* 3717.—DISTRIB. Andamans, Mergui.

9. ARDISIA TUBERCULATA, Wall. Cat. 2274 (1829). A shrub, reaching 10 feet in height; branchlets smooth, stout, reddish, uppermost flattened, glabrous. *Leaves* entire, coriaceous; elliptic, bluntly acuminate at apex, attenuate or rounded at the base; glabrous and shining above, covered beneath with rather deciduous peltate scales, dark when dry; 3 to 6 in. long, 1 to 2 in. broad; midrib prominent; main-nerves obscure, about 15 pairs, starting at an angle of about 75° from the midrib, then arched upwards to and along the margin; secondary nerves more slender, reticulations obscure; petiole ·3 to ·5 in. long, thick, rough, winged by the decurrent margins of the blade. *Inflorescence* a lax, leafy, terminal, tripinnate, 3 to 6 in. long, panicle; rachis flexuous, flattened, often scaly; primary peduncles squarrose, ·6 to 1 in. long, supported by ovate acuminate leafy bracts; secondary peduncles also squarrose,

·3 to ·5 in. long with subulate bracts; ultimate racemes umbellate, 6–8-flowered; pedicels slender, short, ·1 to ·15 in. long; bracteoles subulate; buds ovoid, obtuse, glabrous. *Calyx-lobes* ovate, acute or rounded, ·05 in. long; margin ciliate, dotted with black glands. *Corolla-lobes* broadly ovate, blunt, glabrous, ·1 in. long, with very few dots; tube very short. *Stamens* a little shorter than the corolla-lobes; anthers acute, but gland-dotted behind; filaments minute, broad. *Ovary* globose; style subulate, longer than the petals. *Berry* obovoid, smooth, ·15 to ·2 in. in diam. A. DC. in Trans. Linn. Soc. XVII. 119, Prod. VIII. 130; Miq. Fl. Ind. Bat. II. 1026; Clarke in Hook. f. Fl. Br. Ind. III. 521, *except var.*; Mez Monog. Myrs. 112, fig. 16. *A chrysophylloides*, Miq. Fl. Ind. Bat. Suppl. 574.

PENANG: *Wallich* 2274. MALACCA: *Derry* 394. PAHANG: *Ridley* 1071. JOHORE: *Ridley* 6438. SINGAPORE: *Griffith* (K.D.) 3564; *Maingay* (K.D.) 1014; *Ridley* 2817, 8916, 1916(A).—DISTRIB. Bangka *Teysmann*.

10. ARDISIA OPHIRENSIS, Mez Monog. Myrs. 113 (1901). A shrub (?); branchlets pale brown, flattened, smooth; innovations minutely ferruginous-scaly. *Leaves* coriaceous; elliptic, shortly acuminate at apex, rounded or somewhat acute at base; pale and somewhat shining on both surfaces, the under covered with minute brown peltate scales; glands scattered, numerous; 3 to 6 in. long, 1·75 to 2·25 in. broad; midrib thick, prominent; main-nerves prominent, raised on both surfaces, 10 to 12 pairs, starting at an angle of about 75° with the midrib, at first straight then curving upwards to meet some way from the margin in a prominent network; secondary nerves prominent, reticulations transverse; petiole ·4 to ·5 in. long, thick, bordered above by the decurrent margins of the blade. *Inflorescence* a terminal, leafy, angular, tripinnate panicle, about 3 to 4 in. long; rachis flexuous, flattened, scaly; peduncles squarrose, about 1 in. long, supported by ovate-oblong, reflexed, leafy bracts; pedicels ·3 in. long, slender, in fruit very spreading. *Calyx-lobes* ovate, acute, ·05 in. long, back dotted with prominent large glands. *Corolla-lobes* elliptic-ovate, rather oblique, shortly connate, nervose; glands few, near the apex, black. *Stamens* rather shorter than the corolla-lobes; anthers ovate, large, not glandular, apiculate; filaments short, slender. *Ovary* ovoid, glabrous; style long, subulate, exsert. *Berry* black when dry, ·15 in. in diam., with prominent glands. *A. tuberculata* var. *ophirensis*, Clarke in Hook. f. Fl. Br. Ind. III. 522.

MALACCA: *Hullett* 754; *Ridley* 621; *Miller* 9. On the top of Mount Ophir.

11. ARDISIA LABISIÆFOLIA, King & Gamble, n. sp. A small tree; branchlets thick, slightly flattened, smooth, glabrous below, lepidote-

scaly above. *Leaves* coriaceous; elliptic or elliptic-oblong, shortly and rather abruptly acuminate at apex, rounded at base; glabrous above when old, when young densely covered, as is the under-surface always, with rather large reddish-brown peltate scales, margins recurved; 6 to 8 in. long, 2 to 4 in. broad; midrib thick, prominent, impressed above; main-nerves 24 to 30 pairs, irregularly spaced, at first parallel, leaving the midrib nearly at right angles, then near the margin curving upwards to and along the margin and anastomosing with the prominent secondary nerves which resemble the main ones; reticulations prominent in an elegant network, all more or less raised above when dry; petiole ·5 to ·8 in. long, thick, bordered above by the decurrent margins of the blade. *Inflorescence* a pyramidal, rusty-scaly, bracteate, tripinnate panicle, up to 6 in. long, the branches bearing sub-umbellate, pedunculate clusters of small flowers; rachis somewhat flattened, rusty-scaly; bracts leafy spathulate; bracteoles minute, ovate; pedicels ·1 to ·2 in. long, reflexed. *Calyx-lobes* ovate, ·06 in. long, ciliate, scaly and glandular-dotted; tube one-third of lobes. *Corolla-lobes* deep pink, ovate-acute, ·14 in. long, with a very few black glands. *Stamens* nearly as long as corolla-lobes; anthers ovate, acute, ·1 in. long, apiculate; filaments rather thick, ·3 to ·4 in. long, minutely pubescent. *Ovary* rounded, glabrous; style slender, exsert. *Berry* globose, often depressed at top, ·15 to ·2 in. in diam., black when dry.

PERAK: *Wray* 320, 1566; *Scortechini*. Hilltops at 6,500 to 7,000 feet.

12. ARDISIA MONTANA, King & Gamble, n. sp. A shrub reaching 4 to 6 feet in height; branchlets brown, somewhat angular, uppermost covered with a nearly furfuraceous glandular tomentum. *Leaves* coriaceous; elliptic-oblong or oblong-lanceolate, obtusely acuminate at apex, rounded or attenuate at base; scaly above, densely ferruginous-hairy and scaly beneath, scales stellate; glandular dots scattered, obscure; margins slightly recurved; 4 to 6 in. long, 1 to 2 in. broad; midrib prominent, impressed above; main-nerves 20 pairs, obscure, irregular, starting nearly at right angles to the midrib and curving upwards to and along the margin; secondary nerves many, reticulations obscure; petiole ·5 in. long, channelled above by the decurrent margins of the blade, densely scaly and ferruginous-pubescent. *Inflorescence* a rather lax, terminal, pyramidal, bi–tri-pinnate, leafy panicle, up to 6 in. long in fruit, shorter in flower, the branches bearing sub-umbellate pedunculate clusters of minute flowers; rachis somewhat flattened, furfuraceous-scaly; branches squarrose; peduncles ·5 to ·7 in. long; umbel-peduncles ·5 in. long; pedicels ·2 in. long, often reflexed; bracts leafy, deciduous; bracteoles ovate, very small. *Calyx-lobes* ovate-acute, under ·05 in. long, margins scarious ciliate, dotted with large glands.

Corolla-lobes slightly longer than calyx-lobes, ovate, glabrous, gland-dotted. *Stamens* as long as corolla-lobes; anthers ovate, apiculate; filaments extremely short. *Ovary* rounded, glabrous; style subulate, rather thick, scarcely exsert. *Berry* red, globose, ·15 in. in diam., gland-dotted when dry.

PERAK: *Wray* 327, 3869; *Scortechini* 296; *King's Collector* 8029. Rocks and hilltops at 3,000 to 7,000 feet.

13. ARDISIA SINUATA, King & Gamble, n. sp. A shrub or small tree, reaching a height of 10 to 15 feet and a diam. of stem of 2 to 3 in.; branchlets pale brown, sinuate, compressed, with raised lines joining the sides of the bases of the petioles, minutely scaly-pubescent or nearly glabrous. *Leaves* chartaceous; elliptic-oblong, acute or shortly acuminate at apex, rounded or attenuate at base; glabrous above, minutely scaly beneath when young, afterwards glabrate; glandular dots few, scattered; 3 to 6 in. long, 1 to 2 in. broad; midrib slender; main-nerves 10 to 12 pairs, ·3 to ·4 in. apart, starting from the midrib at an angle of 60° and at once curving upwards to and along the margin; secondary nerves and reticulations faint; petiole ·3 to ·4 in. long, channelled above by the decurrent margins of the blade. *Inflorescence* a lax, terminal, bracteate, nearly glabrous, bi–tri-pinnate panicle 5 to 7 in. long, the branches bearing subumbellate clusters of small flowers; rachis flat, sinuate; bracts leafy, uppermost lanceolate recurved, ·5 to 1 in. long; bracteoles minute, ovate; pedicels slender, ·1 in. long. *Calyx-lobes* triangular-ovate, glabrous, ciliate, gland-dotted, ·04 in. long. *Corolla-lobes* pale green or pink, ovate, acute; margins transparent. *Stamens* nearly as long as corolla-lobes; anthers broadly ovate, shortly apiculate; filaments very short. *Ovary* rounded, glabrous; style slender, exsert, ·1 to ·15 in. long. *Berry* globose, ·15 in. in diam., obscurely striate and black when dry.

PERAK: *Wray* 2408, 3023; *King's Collector* 4599.

14. ARDISIA COLORATA, Roxb. Hort. Beng. 16 (1814), Fl. Ind. I. 581, and Fl. Ind. Ed. Carey and Wall. II. 271. A large shrub or small tree, reaching 25 feet in height and a girth of 1 foot; branchlets compressed, pale brown, more or less lepidote-scaly, furnished with somewhat zigzag raised lines proceeding downwards from the sides of the bases of the petioles. *Leaves* chartaceous; oblong-lanceolate or elliptic-lanceolate, acute or shortly acuminate at apex, cuneate at base; glabrous on both surfaces, entire; glandular dots many, irregularly scattered, chiefly visible on the upper surface; 5 to 10 in. long, 1·5 to 3 in. broad; midrib prominent beneath, impressed above; main-nerves 20 to 30, also prominently raised beneath and impressed above, usually ·3 to ·4 in. apart, starting at an angle of 70° to 75° with the midrib, at first straight

then arched upwards to and along the margin; secondary nerves many, slender, 1 to 2 between each pair of main-nerves, reticulations oblique; petiole rather thick, ·5 to ·8 in. long, channelled above, winged by the decurrent margins of the blade. *Inflorescence* a pyramidal terminal panicle, 4 to 12 in. long, tripinnate, ferruginous scaly, bearing clustered umbellate racemes of flowers; rachis much flattened, as are its branch peduncles; primary branches 2 to 6 in. long, peduncle ·5 in., bracts caducous; secondary branches ·5 to 1 in. long, peduncles ·2 to ·4 in., bracteoles small, ovate-acuminate; pedicels slender. ·1 to ·2 in. long; umbels many-flowered. *Calyx-lobes* ovate, bluntly acute, ·05 to ·08 in. long, densely gland-dotted, margins scarious and ciliate; tube rather shorter than lobes. *Corolla-lobes* pink, ovate-acute, oblique, unequal, about ·15 in. long, not gland-dotted; tube very short. *Stamens* a little shorter than corolla-lobes; anthers sagittate, acuminate; filaments very short. *Ovary* ovoid, glabrous; style thick, ·2 in. long. *Berry* globose, ·2 to ·25 in. in diam., deep red to black, obscurely ribbed when dry, shining. Clarke in Hook. f. Fl. Br. Ind. III. 520; Mez Monog. Myrs. 113. *A. pyramidalis*, Roth Nov. Pl. Sp. 123 (*not of* Cav.). *A. Rothii*, A. DC. in Trans. Linn. Soc. XVII. 117, Prod. VIII. 126. *A. anceps*, Wall. in Roxb. Fl. Ind. l.c. 280, and Cat. 2261; DC. Prod. l.c.; Kurz in Journ. As. Soc. Beng. XLVI. II. 224, and For. Fl. II. 107; Scheff. Myrs. 77. *A. polycarpa*, Wall. Cat. 2285. *A. grandiflora*, Wall. Cat. 2272.

Kedah: *Ridley* 5509. Perak: *Scortechini* 20, 203, 397, 1505, 1568; *King's Collector* 798, 1301, 3099, 3284, 3567, 6473, 6823, 7741, 8252, 10866; *Ridley* 5508. Province Wellesley: *Ridley* 6945. Selangor: *Ridley* 7559; *Goodenough* 10551. Malacca: *Maingay* (K.D.) 1008; *Goodenough* 1762; *Derry* 553, 915, 1075; *Ridley* 1245, 1581, 2817.—Distrib. India, Burma, Malay Islands.

Var. *polyneura*, Clarke in Hook. f. Fl. Br. Ind. III. 520. *Leaves* paler when dry than in the typical form; wide, reaching 4·5 in. in width, sometimes reaching 15 in. in length; more usually elliptic, oblong or obovate, more rounded at base; all nerves more prominent. *Panicle* wide at the base; pedicels much reflexed; rachis very much flattened. *A. polyneura*, Miq. in Pl. Jungh. I. 198, and Fl. Ind. Bat. II. 1022; Scheff. Myrs. 81.

Perak: *Ridley* 3000; *Scortechini* 1290, 1412; *Wray* 1643, 1950, 2810; *King's Collector* 527, 2152, 2197, 2629, 3643, 3655, 3657, 4119, 4751, 6922, 8640. Malacca: *Griffith* (K.D.) 3568.—Distrib. Java.

Var. *complanata*, Clarke l.c. *Panicles* smaller, rusty-pubescent; flowers and berries smaller; panicle, rachis, and branches much flattened. *Leaves* usually narrower and smaller, rarely over 7 in. long and 2·75 in. broad. *A. complanata*, Wall. Cat. 2277; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 210; DC. Prod. VIII. 126; Scheff. Myrs. 78; Miq. Fl. Ind. Bat. II. 1024. *A. sanguinolenta*, Bl. Bijdr. 685 (*not of* Wall.). *A. Zollingeri*, DC. Prod. VIII. 670.

PENANG: *Wallich* 2277; *Curtis* 1052, 22494. PERAK: *Wray* 2896, 3929; *Scortechini* 144, 112; *King's Collector* 7680.—DISTRIB. Chittagong, Java, Sumatra.

VAR. *salicifolia*, King & Gamble. *Leaves* lanceolate, 5 to 7 in. long, 1 to 1·5 in. broad, glabrous, obscurely gland-dotted; main-nerves not prominent. *Panicles* spreading, leafy; rachis zigzag, much flattened; bracteoles persistent.

PERAK: *Wray* 2960; *King's Collector* 3216, 6816, 8563. MALACCA: *Hervey*.

VAR. *elliptica*, King & Gamble. *Leaves* elliptic or elliptic-obovate, acuminate at apex, cuneate at base, glabrous; 4·5 to 8 in. long, 2 to 3 in. broad; main-nerves fewer, 15 to 20 pairs, less prominent. *Panicles* rather short and stout, 4 to 6 in. long, pyramidal, rachis less flattened, scarcely zigzag.

PERAK: *Wray* 3293; *King's Collector* 3326, 3453, 5057, 6473, 6624, 6820, 8856.

15. ARDISIA CRASSA, Clarke in Hook. f. Fl. Br. Ind. III. 518 (1882). A small tree; branches pale brown, rounded, stout; branchlets somewhat flattened above and with raised lines from below the base of the petioles. *Leaves* coriaceous; oblong, acute or slightly blunt-acuminate above, cuneate at base; glabrous and shining above, rufescent and with inconspicuous rounded scales beneath; entire; 4 to 9 in. long, 1·5 to 2·5 in. broad; midrib prominent beneath; main-nerves nearly regular at first, nearly at right angles to midrib, afterwards arching upwards and round parallel to the edge, 20 to 27 pairs, secondary obscure. *Inflorescence* a terminal rusty-pubescent panicle, 5 to 6 in. long, with remote branches ending in closely packed umbels; rachis thick, much flattened, flexuose; branches first at right angles, then curved, ·5 to ·8 in. long; pedicels very short, thick; bracteoles ovate, blunt, about ·1 in. long. *Calyx-lobes* thick, ovate-orbicular, ·2 in. long, minutely ferruginous-pubescent, overlapping to right; tube about half the length of the lobes. *Corolla-lobes* broadly ovate, unequal, obliquely and shortly acute, ·15 in. long. *Stamens* shorter than corolla-lobes; anthers ovate, acute; filaments very short, broad at base. *Ovary* rounded, glabrous; style short, about ·1 in. long, subulate. *Berry* globose, depressed, not striate, ·25 in. in diam. Mez Monog. Myrs. 114.

MALACCA: *Maingay* (K.D.) 1015; *Goodenough* 1808.—DISTRIB. Borneo.

16. ARDISIA PLATYCLADA, King & Gamble, n. sp. A small tree or shrub reaching 10 to 15 feet in height; branchlets pale brown, prominently marked by zigzag raised lines joining the sides of the bases of the petioles; uppermost ones prominently flattened and covered with rusty furfuraceous scales, as are also the young leaves. *Leaves* chartaceous; oblong or elliptic-oblong, abruptly acuminate at apex, attenuate and somewhat rounded at base; both surfaces covered when young with rusty stellate scales, glabrescent when old; margins undulate, recurved; 4 to 6 in. long, 1·5 to 2 in. broad; midrib slender but prominent beneath, impressed above; main-nerves 14 to 18 pairs, ·3 to ·4 in. apart, rather irregularly parallel, leaving the midrib at an angle of about 65° and joining at ·1 to ·2 in. from the margin in a very prominent intramarginal looped nerve; secondary nerves and reticulations obscure; petiole none or very short, rarely ·2 in. long, rugose, rusty-scaly, and bordered by the decurrent margins of the blade. *Inflorescence* a terminal, compact, bracteate, rusty-scaly, pyramidal, bi–tri-pinnate panicle, 4 to 5 in. long, the flowers in dense subumbellate clusters on the branches; rachis flattened, flexuose; bracts foliaceous, spathulate or oblong-lanceolate, ·5 to 1·5 in. long; bracteoles small, triangular-subulate; pedicels glabrous, cernuous, about ·1 in. long; buds very small, conical. *Calyx-lobes* pink, lanceolate, ·04 in. long, ciliate, obscurely red-gland-dotted; tube as long as or rather shorter than the lobes. *Corolla-lobes* waxy-white, ovate-acuminate, ·07 in. long, slightly gland-dotted; tube very short. *Stamens* shorter than corolla-lobes; anthers ovate, apiculate; filaments very short. *Ovary* rounded, minutely pubescent at top; style straight, ·15 in. long, exsert. *Berry* globose, ·15 to ·2 in. in diam., glandular-rugose, dark blue, black when dry.

PERAK: *Scortechini* 232; *King's Collector* 824, 4569, 5863, 8136, 10140; usually in dense mixed forest.

A. pterocaulis, Miq.; Mez Monog. Myrs. 111, a tree of the forests of the Sumatran mountains, much resembles this at first sight, but the leaves are bigger, the flower panicles much larger and more open, with shorter pedicels, and the nerves of the leaves do not meet in a prominent looped intramarginal nerve. (*Forbes* 1992 in Herb. Calc.)

17. ARDISIA POROSA, Clarke in Hook. f. Fl. Br. Ind. III. 522 (1882). A shrub, reaching 8 feet in height; branches flexuose, almost zigzag, winged by lines decurrent from the bases of the leaf-petioles. *Leaves* chartaceous; oblong, acute at apex, cuneate at base or sometimes rounded-acute; glabrous, pale beneath; entire, margin often recurved; glands small and obscure; 5 to 9 in. long, 1·5 to 2·5 in. broad; midrib rather slender, prominent beneath; main-nerves obscure, irregular, about

20 to 25 pairs; secondary faint, all arching upwards into an irregular intramarginal ring and reticulate; petiole ·4 in. long, narrowly winged by the decurrent blade. *Inflorescence* a loose terminal few-flowered panicle up to 6 in. long; rachis flexuous; branches racemose, at right angles to rachis; peduncles 1 to 1·5 in. long, curving upwards; pedicels ·5 to ·7 in. long, slender, curved upwards; bracteoles minute, ovate, deciduous; flowers 3–5-, usually 4-merous; buds slender. *Calyx-lobes* ovate, ·04 in. long, obscurely dotted; tube short. *Corolla-lobes* ovate-lanceolate, pink, ·3 in. long by ·1 in. broad, recurved in flower, not dotted but striate. *Stamens* as long as corolla-lobes; anthers very slender, opening by terminal pores as well as longitudinally; filaments very short, thick. *Ovary* conical, gradually passing into a slender style ·25 in. long. *Berry* globose, ·25 in. in diam., ribbed, glossy black when ripe. Koord. & Val. Bijdr. V. 260; Mez Monog. Myrs. 118.

PERAK: *Scortechini* 116, 1511; *King's Collector* 3108. MALACCA: *Griffith* (K.D.) 3578; *Maingay* (K.D.) 1012; *Wray* 39; *Goodenough* 1528; *Hervey*.

18. ARDISIA DIVERGENS, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 583, and Fl. Ind. ed. Carey & Wall. II. 275. A small tree, reaching 20 feet in height; branchlets slender, smooth, rounded. *Leaves* chartaceous; elliptic or lanceolate, shortly acuminate at apex, rounded at base, drying reddish-brown; glabrous on both surfaces; entire, margins slightly incurved; glandular dots large, prominent, especially near the margin; 3 to 5 in. long, 1 to 2 in. broad; midrib prominent beneath; primary nerves 8 to 12 pairs, irregular, arched and joining in an intramarginal prominent nerve with a smaller, less prominent nerve near the edge; secondary nerves few, slender, reticulate; petiole ·15 to ·3 in. long, winged by the decurrent blade. *Inflorescence* a loose terminal rusty-pubescent panicle, 2 to 3 in. long, ultimate branches umbelled, 3–5-flowered; main peduncle ·5 to 1 in. long, secondary peduncles about ·5 in. with lanceolate leafy recurved bracts; pedicels about ·4 in. long, thickened above, glandular; bracteoles ovate, deciduous; flowers red, buds short, conical. *Calyx-lobes* rounded, ·05 in. in diam., ciliate, conspicuously dotted with few large, transparent, light brown glands; tube short. *Corolla-lobes* ovate, acute, ·15 to ·2 in. long, unequal in size, and oblique; tube very short, dots very few. *Stamens* a little shorter than the corolla-lobes; anthers large, ovate-acute; filaments very short. *Ovary* ovoid, glabrous, attenuated into a ·1 in. long style. *Berry* round, smooth, somewhat depressed, tipped by the persistent style. Wall. Cat. 2269; A. DC. Prod. VIII. 130; Clarke in Hook. f. Fl. Br. Ind. III. 521; Mez Monog. Myrs. 117. *A. punctata*, Jack;

Roxb. Fl. Ind. ed. Carey & Wall. II. 275 (*not of* Lindl.). *A. punctulosa*, D. Dietr. Syn. Pl. I. 615; Miq. Fl. Ind. Bat. II. 1025.

PENANG: *Jack*; *Wallich* 2269; *Maingay* (K.D.) 1020; *Curtis* 1769.

19. ARDISIA SUMATRANA, Miq. Pl. Jungh. I. 195 (1853), Fl. Ind. Bat. II. 1018, and Suppl. 247. A large shrub or small tree, reaching 15 to 20 feet in height and 3 to 4 in. in diam. of stem; branches pale brown, smooth; branchlets minutely ferruginous-scaly. *Leaves* chartaceous; elliptic-oblong or -obovate, rather suddenly acute at apex, acute or cuneate at base; entire, glabrous; glands large, frequent near the margin; 3 to 6 in. long, 1·5 to 2·5 in. broad; midrib slender, prominent beneath, impressed above; main-nerves 12 to 15 pairs, irregularly spaced, starting at an angle of about 50° with the midrib, curving upwards to and along the margin; secondary nerves and innovations indistinct; petiole ·3 to ·5 in. long, bordered above by the decurrent, often erose, margins of the blade. *Inflorescence* a compact, shortly pyramidal, 3 to 4 in. long, squarrosely bipinnate panicle; common peduncle none or scarcely ·5 in. long; bracts minute, triangular; branch peduncles ·7 to 1 in. long, minutely ferruginous-scaly as is the rachis; pedicels ·2 to ·3 in. long, slender; buds ovoid, conical; flowers waxy-white, pedicels and rachis pink. *Calyx-lobes* orbicular, ·1 in broad, ciliate, with scarious margins, much overlapping; glandular dots very few, scattered. *Corolla-lobes* shortly connate, ovate, acute, much twisted, ·15 in. long; margins thin, denticulate; glands few, large and brown. *Stamens* about two-thirds the length of the corolla-lobes; anthers ovate-acute, ·1 in. long, a few large black glands on the back. *Ovary* ovoid, glabrous; style subulate, ·15 in. long. *Berry* bright red at first afterwards black, globose, shining, ·2 in. in diam., smooth, faintly striate. Scheff. Myrs. 84; Koord. & Val. Bijdr. V. 268; Mez Monog. Myrs. 121.

PERAK: *King's Collector* 771, 5639, 10836.—DISTRIB. Sumatra, *Beccari* 325, 724; *Forbes* 2083 &c.; Java.

20. ARDISIA LANCEOLATA, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 583, and Fl. Ind. ed. Carey & Wall. II. 275. A large glabrous shrub or small tree, reaching 15 to 25 feet in height; branches cylindric, pale, smooth; branchlets sometimes fugaciously ferruginous-scaly. *Leaves* coriaceous; elliptic-oblong or -obovate, shortly acuminate at apex, long-cuneate at base; entire or sometimes slightly crenate near the apex; glabrous on both surfaces; glandular dots large scattered, more numerous near the margins; 6 to 11 in. long, 2 to 3·5 in. broad; midrib prominent beneath, impressed above; main-nerves 12 to 15 pairs, oblique, starting at an angle of about 50° with the midrib, and at first more or less parallel, then arching upwards to join in an irregular intramarginal nerve; secondary nerves similar but shorter, reticulations scarcely prominent,

irregular; petiole ·5 to ·7 in. long, winged by the decurrent blade, the wings overlapping. *Inflorescence* a spreading, terminal or sometimes sub-axillary, panicle, 4 to 6 in. long; rachis flexuose, angular or flattened; branches stout, flattened, swollen at base, bearing corymbose racemes of about 7–8 flowers; pedicels ·6 to 1 in. long, stout, narrowly clavate, striate, minutely ferruginous-pubescent; bracteoles small, obtuse, deciduous. *Calyx-lobes* orbicular, ·2 in. in diam., enlarged and spreading in fruit, glabrous or slightly pubescent; margins scarious and fimbriate-ciliate, base thickened; glandular dots many, prominent; tube short. *Corolla* ovate acuminate, pink, much twisted in bud, ·35 in. long, of which one-third tube; lobes unequal in size, oblique, dots not prominent. *Stamens* large, shorter than corolla-lobes; anthers ovate acute, dehiscing longitudinally, back with few large usually oblong prominent black glands. *Ovary* globose; style ·1 to ·2 in. long, subulate, twisted. *Berry* globose, depressed, smooth, ·25 to ·3 in. in diam., black when dry. Wall. Cat. 2292; A. DC. Prod. VIII. 126; Miq. Fl. Ind. Bat. II. 1025; Clarke in Hook. f. Fl. Br. Ind. III. 519; Mez Monog. Myrs. 122. *A. speciosa*, Bl. Bijdr. 684; A. DC. l.c. 133; Miq. in Pl. Jungh. I. 197 and Fl. Ind. Bat. II. 1022; Scheff. Myrs. 88; Mez Monog. Myrs. 123. *A. purpurea*, Reinw.; Bl. Bijdr. 684; A. DC. l.c. 129; Miq. in Pl. Jungh. I. 197 and Fl. Ind. Bat. 1026; Scheff. Myrs. 88; Koord. & Val. Bijdr. V. 265. *A. Hasseltii*, Blume; Scheff. Myrs. 86; Mez Monog. Myrs. 123. *A. mucronata*, Bl. Bijdr. 685; A. DC. l.c. 126; Scheff. Myrs. 83; Koord. & Val. Bijdr. V.269; Mez Monog. Myrs. 123. *A. Leschenaultii*, DC. l.c. 133; Miq. Pl. Jungh. I. 197 and Fl. Ind. Bat. II. 1022; Scheff. Myrs. 89. *A. plagioneura*, Scheff. Myrs. 85; Koord. & Val. Bijdr. V. 268.

PENANG: *Roxburgh*; *Curtis* 2755. PERAK: *Scortechini* 1824; *Wray* 192, 1401, 2480, 2863, 3659; *King's Collector* 2954, 3200, 4528, 4785, 6586, 6785, 8730, 10049. MALACCA: *Griffith* (K.D.) 3569, 3579; *Derry* 512, 1117. JOHORE: *Lake & Kelsall* 4033. SINGAPORE: *Major McNair*; *Cantley* 133; *Ridley* 6136, 6436.—DISTRIB. Java, Sumatra, Borneo, Celebes.

21. ARDISIA LITTORALIS, Andr. Repos. X. t. 630 (1811). A glabrous shrub of succulent character, reaching 8 to 10 feet in height; branches thick, rounded; buds lanceolate. *Leaves* succulent-coriaceous; obovate or oblong-obovate, rounded or bluntly acute or almost lanceolate at apex, cuneate at base; entire; glandular dots many, scattered, inconspicuous; 2 to 5 in. long, 1 to 2·5 in. broad; midrib prominent; main-nerves invisible in the fresh plant, obscure when dry, irregular, 13 to 18 pairs, at an angle of about 60° with the midrib, curved upwards to and along the margin; secondary nerves similar, slender, reticulations

obscure; petiole ·3 in. long, thick, winged by the decurrent margins of the blade, which are often erose or wrinkled. *Inflorescence* of axillary umbellate racemes of about 8 flowers each, racemes shorter than the leaves, about 2 in. long; common peduncle about 1 in. long, usually recurved; pedicels ·3 in. long, enlarged in fruit to ·5 in. and then clavate thickened; bracteoles oblong, obtuse, deciduous; flowers rose-coloured, buds conica ·4 in. long. *Calyx-lobes* orbicular, ·1 in. in diam., ciliate, edges somewhat scarious, elsewhere thickly dotted with black glands, tube rather longer than lobes. *Corolla-lobes* ovate acuminate, oblique, unequal, lineolate and much gland-dotted, ·3 in. long; tube short. *Stamens* nearly as long as corolla-lobes; anthers ovate, acute, united in a cone, opening longitudinally and obscurely septate in the cells; filaments short, on broad bases confluent into a ring adherent to the corolla-lobes. *Ovary* sub-globose, ending in a subulate style ·3 in. long. *Berry* globose, depressed, ·2 in. in diam., smooth, bright red, turning purplish-black when ripe; black glands many, small. Kurz For. Fl. II. 110 and Journ. As. Soc. Beng. XLVI. II. 226. *A. obovata*, Bl. Bijdr. 688; DC. Prod. VIII. 132. *A. humilis*, Clarke in Hook. f. Fl. Br. Ind. III. 529 (*not of* Vahl. *and in part only*); Mez Monog. Myrs. 127, fig. 20, A–E. *A. umbellata*, Roxb. Hort. Beng. 16; Fl. Ind. I. 582; Fl. Ind. ed. Carey & Wall. II. 273; Lodd. Bot. Cat. t. 531. *A. solanacea*, Wall. Cat. 2283A (*part*), 2283D (*not of* Roxb.). *A. polycephala*, Wight Ill. Ind. Bot. t. 145 (*not of* Wall.). *Climacandra obovata*, Miq. Pl. Jungh. I. 199, Fl. Ind. Bat. II. 1030; Scheff. Myrs. 05; Koord & Val. Bijdr. V. 271. *C. littoralis*, Kurz in Journ. As. Soc. Beng. XL. II. 68.

PENANG: *Curtis* 217; *Phillips*. PERAK: *Wray* 1866, 2373; *Scortechini* 1053; *King's Collector* 4960. MALACCA: *Griffith*; *Maingay* (K.D.) 1010; *Hervey*. KELANTAN: *Ridley*. PAHANG: *Ridley* 1638. SINGAPORE: *Hullett* 331, 649; *Cantley* 153.—DISTRIB. Malay Islands and eastwards to South China and the Philippines; westwards to Ceylon (C.P. 1803) and Travancore (*Wight* 1767).

Climacandra multiflora, Miq., and *C. salicifolia*, Miq., are probably only varieties of this species, which seems to be a coast shrub only.

22. ARDISIA KUNSTLERI, King & Gamble, n. sp. A shrub or small tree, usually 6 to 10 feet high, rising sometimes to 20 feet, and with a stem about 2 to 3 in. in diam.; branchlets thick, dark brown, uppermost and innovations rusty-pubescent; leaf-buds lanceolate. *Leaves* coriaceo-chartaceous; elliptic, or elliptic-oblong, shortly acuminate at apex, cuneate at base; minutely pubescent or scaly on both surfaces, afterwards glabrate; entire or obscurely undulate-crenate on the margins

which are somewhat reflexed; glandular dots many, prominent in the areolations of the leaves and along the margins; 8 to 15 in. long, 2·5 to 5 in. broad; midrib slender; main-nerves 20 to 24 pairs, irregularly spaced, starting at an angle of about 65° with the midrib, at first straight then curving upwards to and along the margin where they anastomose; secondary nerves usually one between each pair of main-nerves, reticulations oblique, all raised on the lower surface when dry; petiole 1 to 2·5 in. long, sometimes shorter, thick, channelled above by the decurrent margins of the blade, which are connivent. *Inflorescence* lateral or axillary, a ·5 to ·7 in. long corymbiform minutely pubescent raceme of about 18 to 22 flowers, on a thick flattened peduncle 2 to 4 in. long; bracts small, lanceolate, very early caducous; pedicels slender, clavate, ·7 to 1 in. long, curved upwards in flower downwards in fruit; buds ovoid, ·25 in. long. *Calyx-lobes* orbicular, ·1 in. long, margins scarious ciliate, covered with many black glandular dots; tube shorter than lobes, minutely pubescent without. *Corolla-lobes* dark blue without, pink within, ovate, acute, ·2 in. long, minutely ciliate, prominently dotted, tube ·05 in. long. *Stamens* shorter than corolla-lobes; filaments very short; anthers ovate acuminate, the connective studded on the back with prominent black glands in 2 rows. *Ovary* ovoid, glabrous; style slender, ·15 in. long. *Berry* globose, blueish-black, ·3 in. in diam., faintly striate when dry.

PERAK: *King's Collector* 2207, 2970, 3060, 3264, 4071, 4110, 6486; *Ridley* 9530.

This species is distinguished by its large elliptic leaves, comparatively small flowers, and large fruits, but comes in some respects near to *A. oxyphylla* and in others to *A. solanacea*, and to *A. polycephala*, Wall.

23. ARDISIA SOLANACEA, Roxb. Cor. Pl. 27. t. 27 (1795), Hort. Beng. 16, Fl. Ind. I. 580, and Fl. Ind. ed. Carey & Wall. II. 269. A large shrub, reaching 6 to 8 feet in height; bark ash-coloured, branches stout, glabrous, grey, somewhat angular, buds lanceolate. *Leaves* coriaceous; oblong or elliptic-oblong, acuminate at apex, cuneate at base, glabrous, entire; glandular dots many scattered in the areolations of the nerves and especially near the margin; 6 to 10 in. long, 2 to 3·5 in. broad; midrib slender, somewhat impressed above; main-nerves 12 to 20 pairs, unequally spaced, leaving the midrib at an angle of about 60°, at first straight but soon curving upwards to and along the margin and then anastomosing; secondary nerves many, rather prominent as are the reticulations; petiole stout, ·5 to ·8 in. long, channelled above by the decurrent and often connivent margins of the blade. *Inflorescence* of pedunculate corymbiform racemes, bearing 10 to 16 flowers, from the

axils of the upper leaves or of the scars of fallen leaves, 2 to 4 in. long; peduncle 1 to 2·5 in. long, stout, flattened above as is the very short rachis of the raceme; bracteoles concave, thin, prominently gland-dotted; pedicels ·7 to 1 in. long, more or less clavate, slender at first, thicker in fruit; buds conical, ·4 in. long. *Calyx-lobes* orbicular, ciliate, scarious on the margins, ·15 to ·2 in. long, prominently black-gland-dotted; tube nearly equal to lobes. *Corolla-lobes* pink, ovate, rounded, ·3 to ·35 in. long, prominently gland-dotted, minutely ciliate on the margins, otherwise glabrous; tube extremely short. *Stamens* about two-thirds the length of the corolla-lobes; filaments short, stout, conical; anthers ovate-sagittate, ·2 in. long, acute, apiculate, the back of the connective studded with prominent large black glands in a double row. *Ovary* ovoid, glabrous; style slender, ·25 in. long. *Berry* globose, dark blue or black, ·3 in. in diam. Willd. Sp. Pl. I. 1063; Bot. Mag. t. 1677; Wall. Cat. 2283 A–K; Mez Monog. Myrs. 132, fig. 20 F–K; Cooke Bomb. Fl. II. 86. *A. humilis*, A. DC. in Trans. Linn. Soc. XVII. 118 (*not of* Vahl); Wight Ic. t. 1212; Dalz. & Gibs. Bomb. Pl. 137; Clarke in Hook. f. Fl. Br. Ind. III. 529 (*in part*); Brandis For. Fl. 287; Kurz in Journ. As. Soc. XLVI. II. 226, and For. Fl. II. 100; Prain Beng. Pl. 645. *A. elliptica*, Bedd. Fl. Sylv. p. CXXXVIII. (*not of* Thunb.).

PERAK: *Wray* 1900, 3000; *King's Collector* 6011.—DISTRIB. India, Burma.

VAR. *elata*, King & Gamble. A small tree reaching 25 to 35 feet in height, and 6 to 8 in. in diam. *Leaves* thinner, oblong-lanceolate; main-nerves less prominent than in the type. *Inflorescence* with rather longer stouter peduncles and more numerous flowers. *Berry* slightly larger.

PERAK: *Scortechini* 679; *King's Collector* 4717, 5770.

This variety is scarcely worthy of being classed as such, but, at any rate in the herbarium, the specimens are easily separable.

24. ARDISIA LURIDA, Blume Bijdr. 687 (1826). A large shrub, reaching 20 feet in height and 3 to 4 in. in diam. of stem; branchlets thick, glabrous, as are the lanceolate acuminate leaf-buds. *Leaves* entire, coriaceous; lanceolate- or sub-obovate-oblong, shortly acuminate at apex, gradually cuneate at base; glabrous and dark green above, pale and ferruginous-brown beneath; glands many, regularly scattered in the areoles of the net venation; 5 to 10 in. long, 1·5 to 2·5 in. broad; midrib prominent; main-nerves 16 to 20 pairs, slender, irregular, starting at about 60° with the midrib, parallel at first and then arched up to and along the margin where they meet; secondary nerves similar, reticulations obscure; petiole ·4 to ·7 in. long, winged by the decurrent edges of the blade, the

wings connivent above when dry. *Inflorescence* a short (2 to 3 in. long), axillary, few-flowered, sub-umbellate, minutely ferruginous-pubescent, peduncled raceme; peduncles 1 to 1·5 in. long, flattened; pedicels ·4 to ·6 in. in flower, longer in fruit and then clavate; flowers large, waxy, pinkish-white; buds rounded, ·4 to ·5 in. long. *Calyx-lobes* ovate-orbicular, emarginate, scarious and ciliate at the edges, puberulous outside, ·2 in. in diam., glandular dots conspicuous, of various sizes, black and brown mixed; tube short. *Corolla-lobes* ovate, obtuse, oblique, concave and keeled, ·4 in. long, ·2 in. broad, glandular dots and lineoles prominent, tube very short. *Stamens* two-thirds as long as petals; anthers hastate, mucronate, opening by longitudinal slits, prominently dotted on the back with large black glands. *Ovary* rounded, ending in a short subulate style. *Berry* globose, apiculate, ·4 in. in diam., smooth, gland-dotted. A. DC. Prod. VIII. 130; Miq. Fl. Ind. Bat. II. 1019; Scheff. Myrs. 71; Koord. & Val. Bijdr. V. 245; Mez Monog. Myrs. 130.

PERAK: *Ridley* 7172, 10319.—DISTRIB. Java.

25. ARDISIA OXYPHYLLA, Wall. Cat. 2291 (1829). A shrub; branchlets rounded, smooth; buds narrowly lanceolate, glabrous. *Leaves* chartaceous; elliptic, acute or shortly acuminate at apex, acutely narrowed at base, entire; glabrous above, glabrous beneath except for a few minute scales; glandular dots many, especially near the margin; 3 to 7 in. long, 1 to 2·5 in. broad; midrib slender, prominent; main-nerves about 16 pairs, irregular, usually at about an angle of 60° with the midrib, more or less parallel at first, then arching nearly to the margin; secondary nerves slender, like the main-nerves, reticulations irregular; petiole ·4 to ·7 in. long, winged by the decurrent margins of the blade. *Inflorescence* an axillary, long-peduncled, short, few-flowered (5 to 8) subumbellate raceme, about 2 to 4 in. long; peduncles 1 to 2 in. long, angular when dry; pedicels ·4 in. long, ·7 in. in fruit, slender; buds rounded, ·3 in. long. *Calyx-lobes* ovate-rotundate, obtuse, ·1 in. in diam., ciliate on the scarious edges, prominently dotted with numerous black and brown glands; tube short. *Corolla-lobes* broadly ovate, sub-acute or obtuse, oblique, ·25 to ·3 in. long, prominently dotted with many black or brown round glands and fewer elongate lineolate ones. *Stamens* nearly as long as corolla-lobes, almost quite sessile; anthers sagittate, long-acute, the connective prominently marked on the back with large black conspicuous glands. *Ovary* rounded, ending in a short ·15 in. long style, glabrous. *Berry* globose, ·3 in. in diam., fleshy, smooth. A. DC. in Trans. Linn. Soc. XVII. 120, Prod. VIII. 130; Clarke in Hook. f. Fl. Br. Ind. III. 528 *variety excepted;* Stapf in Trans. Linn. Soc. Ser. 2. IV. 204; Mez Monog. Myrs. 131.

PENANG: *Wallich* 2291; *Curtis* 668; *Ridley* 7093. PERAK: *King's Collector* 5624, 5913, 5929, 6185, 8218, 10504. PROVINCE WELLESLEY: *Ridley* 6953.—DISTRIB. Andamans or Tenasserim, *Helfer* (K.D.) 3571, 3585; Borneo.

26. ARDISIA SCORTECHINII, King & Gamble, n. sp. A tree reaching 40 to 50 feet in height and 8 to 12 in. in diam.; branchlets round, dark brown, lenticellate, leaf-buds acuminate. *Leaves* entire, coriaceous; obovate, acute at apex, cuneate at base; glabrous, margins incurved; glandular dots many, obscure; 5 to 7 in. long, 1·5 to 2 in. broad; midrib prominent slender; main-nerves 14 to 16 pairs, very oblique, at about 30° to the midrib, curved upwards and joining parallel to the margin; secondary nerves similar but more slender, reticulations curved, surrounding the dots; petiole ·4 in., rather broadly edged by the decurrent margins of the blade, which are nearly connivent above; stipules leafy, more or less persistent. *Inflorescence* 2 in. long, of short axillary peduncled, umbellate racemes 8–12-flowered, in the axils of short leafy bracts; peduncles thick, about 1 in. long, flattened; pedicels ·5 in., thickened and longer in fruit; bracteoles ovate, acute, boat-shaped, deflexed, persistent; flowers reddish-pink. *Calyx-lobes* orbicular, obtuse, ·2 to ·25 in. long, emarginate, ciliate, scarious on the edges, with many parallel veins and many prominent round or oblong mixed black and brown glandular dots; tube short. *Corolla-lobes* ovate, acute, oblique, ·35 in. long, unequal, with very few dots, some round some lineolate, tube very short. *Stamens* shorter than corolla-lobes; anthers long acuminate, villous on the connective on both sides, back marked with large black glands; filaments short, very thick. *Ovary* ovoid, surmounted by the conical, subulate, ·2 in. long, glabrous style. *Berry* globose, smooth, ·3 in. in diam., bluish black.

PERAK: *Scortechini*; *King's Collector* 4662, 4672—on rich soil, in dense jungle, up to 800 feet.

27. ARDISIA PENDULA, Mez Monog. Myrs. 125 (1901). Apparently a shrub; branchlets thick, glabrous below, ferruginous-pubescent at the extremities, leaf-buds lanceolate, ferruginous-pubescent. *Leaves* chartaceous; elliptic lanceolate, long acute at apex, cuneate at base; entire but sometimes very faintly crenate near the apex; glabrous above, glabrous or slightly ferruginous-pubescent beneath; glandular dots scattered, more numerous and prominent near the margins; 4 to 7 in. long, 1·5 to 2 in. broad; midrib slender; main-nerves 10 to 12 pairs, irregular, starting from the midrib at about an angle of 60°, then arching upwards and joining near the margin; secondary nerves slender, minor nerves reticulate; petiole ·3 to ·5 in. long, winged by the decurrent edges of the blade. *Inflorescence* of 3 to 5 in. long axillary peduncled ferruginous-

pubescent racemes; peduncles about 2 in., pedicels ·4 to ·5 in. long, curved. *Calyx-lobes* ovate, rounded, with many glandular dots, ·1 in. long; tube short. *Corolla-lobes* ovate-elliptic, rounded, much gland-dotted. *Stamens* shorter than the petals; anthers acute, dotted on the back; filaments very short. *Ovary* ovoid, glabrous. *Berry* globose, black when dry, ·25 in. in diam., much gland-dotted. *A. attenuata*, Miq. Fl. Ind. Bat. II. 1020 and Suppl. I. 575 (*not of* Wall.); Scheff. Myrs. 68. *A. reclinata*, Blume; Scheff. l.c.

MALACCA: *Goodenough* 1295.—DISTRIB. Java, Sumatra. A poor specimen only available.

28. ARDISIA HULLETTII, Mez Monog. Myrs. 130 (1901). Apparently a shrub; branchlets light brown, round, smooth; leaf-buds lanceolate, glabrous, black. *Leaves* membranous; oblong-lanceolate, acuminate at apex, acuminately narrowed at base; entire, glabrous on both surfaces; glands light-brown, large, in the areoles of beautifully netted venation; 4 to 7 in. long, 1·5 to 2 in. broad; midrib slender; impressed above; main-nerves many, slender, irregular, 20 to 24 pairs, parallel at first and then arching upwards and joining in a narrow intramarginal ring; secondary nerves many, like the main-nerves, reticulations numerous; petiole ·4 in. long, slender, only very narrowly winged. *Inflorescence* an axillary, short, few- (1–5) flowered, glabrous, umbellate raceme, peduncle ·5 to ·7 in. long; pedicels ·5 in. long, recurved, more or less clavate; buds conical, ·3 to ·4 in. long. *Calyx-lobes* scarcely overlapping, ovate-orbicular, ciliate, ·1 to ·15 in. long, minutely gland-dotted; tube short. *Corolla-lobes* ovate-acuminate, upper edges incurved, oblique, unequal, many-nerved, sparsely black-gland-dotted; tube very short. *Stamens* a little shorter than the corolla-lobes; anthers oblong, mucronate, with 2 lines of prominent black glands on the back; filaments short, spreading at base. *Ovary* ovoid, thick, glabrous; style short, ubulate. *Berry* brown, smooth, globose, ·2 in. in diam., seed white-nged at base.

MALACCA: on Mount Ophir, *Hullett* 769, 778.

29. ARDISIA OBLONGIFOLIA, King & Gamble, n. sp. A shrub; branch-ts brown, glabrous, with faint decurrent raised lines from either side of he insertion of the leaf-petioles; leaf-buds lanceolate acuminate. *Leaves* chartaceous; oblong, acute at apex, cuneate at base; glabrous, entire; glandular dots scattered but not prominent except near the margins which are reflexed; 7 to 10 in. long, 2 to 2·5 in. broad; midrib prominent, impressed above; main-nerves 22 to 26 pairs, starting at an angle of nearly 80° from the midrib, at first straight and near the margin curving upwards to and along it; secondary nerves many, usually at least 1 to 2 between each pair of main-nerves, reticulations in an elegant network;

petiole rather slender, ·8 to 1 in. long, bordered above by the decurrent margins of the blade. *Inflorescence* an axillary corymbose raceme of about 8 flowers and about ·5 in. long on a 1·5 to 2 in. long flattened peduncle; pedicels ·75 in. long, clavate. *Calyx-lobes* orbicular, ciliate, gland-dotted, about ·1 in. long; tube as long: rest of flowers unknown. *Berry* globose, ·2 in. long, glandular-dotted.

PERAK: at 1,000 feet, *Wray* 3797.

30. ARDISIA TETRASEPALA, King & Gamble, n. sp. A shrub; branchlets slender, pale brown, with indistinct raised lines from the sides of the leaf-petioles, sinuate, slightly scaly above. *Leaves* chartaceous; elliptic or elliptic-ovate, gradually acuminate at apex, rounded at base; glabrous above, pale brown when dry, very slightly pubescent on and near the midrib beneath; glandular dots many scattered, prominently raised on the upper surface, margins slightly recurved; 4·5 to 6·5 in. long, 1·5 to 2·5 in. broad; midrib prominent below; main-nerves about 16 to 20, irregularly spaced, starting at an angle of 60° from the midrib, curved upwards, dividing and anastomosing with the secondary nerves in a marginal network, all raised beneath; petiole ·2 to ·3 in. long, channelled above. *Inflorescence* a pseudo-terminal subumbellate 8–12-flowered scarcely ·2 in. long raceme in the axil of the uppermost leaf; peduncle about ·5 in. long, pedicels slender, about ·5 in. long. *Calyx-lobes* 4, ovate-orbicular, ciliate, gland-dotted, about ·1 in. long, reflexed in fruit: rest of flower unknown. *Berry* globose, ·25 in. in diam., black when dry and prominently dotted with oblong glands.

JOHORE: at Jaffaria and Gunong Palai, 1,500 feet, *G. King*.

We place this species in TINUS instead of in TINOPSIS because not only does the inflorescence seem to be only apparently terminal but its sub-umbellately racemose character seems to approximate more nearly to that of the former section.

31. ARDISIA BIFLORA, King & Gamble, n. sp. A small shrub, 4 to 8 feet high; branches smooth, pale brown; branchlets divaricate slender. *Leaves* chartaceous; oblong-lanceolate, acuminate at both ape and base; glabrous; entire or very faintly crenulate; glandular do many, black, large, in the areoles of the reticulations; 3 to 5 in. long ·75 to 1·5 in. broad; midrib slender; main-nerves 12 to 14 pairs, at an angle of about 55° with the midrib, curving upwards to and along the margin where they meet in a wavy intramarginal nerve; secondary nerves many, reticulations irregular; petiole slender, ·2 to ·5 in. long, sometimes longer. *Inflorescence* a lateral, 2-flowered, pedunculate umbel, 1·5 in. long; peduncle and pedicels each ·75 in. long, slender. *Calyx-lobes* ovate, scarious and ciliate on the margins, prominently gland-dotted, ·05 in. long; tube as long: rest of flower unknown. *Berry*

black, globose, ·25 in. in diam., ribbed and prominently gland-dotted.

PERAK: in dense jungle on limestone hills at 300 to 800 feet, *King's Collector* 4296, 4711; *Wray* 3343. It is very near *A. paupera*, Mez, of Sumatra, but the long slender peduncle and pedicels distinguish it.

A specimen collected by Scortechini (without number) has similar leaves, but the inflorescence is pseudo-terminal and branched, with more than 2 flowers and very short pedicels.

Ridley's No. 2670 from Pahang seems to be *Ardisia rhyncophylla*, Clarke, but the specimen is imperfect, and we hesitate to describe it as a Malay plant.

32. **ARDISIA TAHANICA**, King & Gamble, n. sp. A shrub (?); branchlets brown, shining, somewhat flattened; innovations scaly and hirsute, leaf-buds ferruginous-pubescent, lanceolate. *Leaves* chartaceous; linear-lanceolate, acuminate at both ends; glabrous above, scaly beneath and slightly pubescent along the midrib; margins entire, recurved; glandular dots numerous, scattered, conspicuous on the under surface; 4 to 6 in. long, ·7 to ·9 in. broad; midrib slender; main-nerves obscure, about 12 pairs, starting at a very oblique angle and curving upwards to and along the margin; secondary nerves similar, reticulations obscure; petiole slender, ·4 to ·6 in. long. *Inflorescence* an umbellate peduncled raceme, 1·5 to 2 in. long, from the axils of some of the upper leaves; peduncle slender, ·7 to 1·2 in. long; flowers about 5–8, pedicels slender, ·5 in. long. *Calyx-lobes* semi-orbicular, scarious and ciliate on the margins, rusty-pubescent on the back and with many glandular dots, ·05 in. long; tube as long as lobes: rest of flower not seen. *Berry* globose, depressed, ·2 in. in diam., prominently striate.

PAHANG: *Ridley* 2669, in Tahan woods.

Goodenough No. 10552, from Selangor, is also possibly the same species, but the leaves reach 1·5 in. in breadth and the peduncle and pedicels are stouter.

33. **ARDISIA VILLOSA**, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 582, and Fl. Ind. ed. Carey & Wall. II. 274. A small shrub, reaching 6 to 8 feet in height; branchlets rounded, from nearly glabrous to densely ferruginous-pilose, the hairs moniliform. *Leaves* chartaceous; oblong-lanceolate or lanceolate, acute or acuminate at apex, cuneate at base; more or less distinctly but shallowly crenate, the crenations broad, margins recurved; glabrous to minutely rusty-hirsute above, densely red-villous beneath, especially on the nerves; glandular dots many, black, prominent; 4 to 8 in. long, ·75 to 2·5 in. broad; midrib prominent; main-nerves 8 to 12 pairs, very irregular, slender, obscure, arching upwards and ending in the crenature-glands; secondary nerves similar, meeting the main-nerves, reticulations faint; petiole ·4 to ·8 in.

long, rusty-villous. *Inflorescence* a sessile or short-peduncled, more or less rusty-villous, umbellate raceme at the end of the main branchlets or at the ends of long-peduncled axillary 2-leaved branchlets; bracts ovate-lanceolate, ·1 to ·2 in. long, deciduous; pedicels ·3 to ·4 in. long, secund; buds conical. *Calyx-lobes* pink, linear-oblong or lingulate, obtuse or slightly acute, ·25 to ·3 in. long, ·075 in. broad, glabrous to thickly rusty-villous, apex often recurved, glandular lines and dots scattered; tube exceedingly short. *Corolla-lobes* pale pink, ovate-acute or -acuminate, ·25 to ·3 in. long, prominently dotted with round or oblong glands, much twisted in bud; tube short. *Stamens* shorter than the petals, ·2 in. long; anthers ovate, acuminate, dehiscing by wide pores in the upper half; filaments very short. *Ovary* globose, crowned by a slender ·2 in. long style, the base of the style and top of ovary minutely pubescent. *Berry* globose, ·25 in. in diam., bright red, sparingly pubescent. A. DC. Prod. VIII. 136; Wall. Cat. 2280A; Miq. Pl. Jungh. 191, Fl. Ind. Bat. II. 1017; Scheff. Myrs. 90; Kurz in Journ. As. Soc. Beng. XLVI. ii. 227 and For. Fl. II. 113; Clarke in Hook. f. Fl. Br. Ind. III. 525 *var. excepted;* Koord. & Val. Bijdr. V. 253. *A. vestita*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 274; A. DC. l.c.; Miq. l.c.; Mez Monog. Myrs. 141. *A. mollis*, Bl. Bijdr. 689. *A. tavoyana*, A. DC. in Trans. Linn. Soc. XVII. 125.

Penang: *Maingay* (K.D.) 1011; *Ridley* 9357; *Curtis* 1597. Perak: *Scortechini* 638; *Wray* 151, 862, 2967, 3149; *King's Collector* 1819, 3138, 6104, 6448, 7915, 10052. Pahang: *Ridley* 2176. Selangor: *Ridley* 1558; *Curtis.* Malacca: *Griffith* (K.D.) 3588; *Hervey; Ridley; Cuming* 2390. Singapore: *Ridley*, 2833, 2816.—Distrib. Burma, Sumatra, Java, Borneo, and eastwards to Tonkin and Hainan.

Var. *glabrata*, Kurz l.c. *Leaves*, at least when full grown, glabrous. *Calyx* glabrous or nearly so. Stapf in Trans. Linn. Soc. Ser. 2, IV. 204. *A. glabrata*, Bl. Bijdr. 692; A. DC. Prod. VIII. 136; Miq. Fl. Ind. Bat. II. 1022.

Perak: *Ridley* 2899; *Wray* 2801, 3414; *King's Collector* 949, 4612, 6188, 6255, 7696; *Scortechini* 315.—Distrib. Java, Sumatra, Borneo.

Ridley's 5510 from Kedah seems to be a form of this with smaller leaves and shorter calyx-lobes, but can hardly be separated as a second variety.

34. Ardisia virens, Kurz For. Fl. II. 575 (1877), and Journ. As. Soc. Beng. XLVI. ii. 226. A small glabrous shrub; branchlets slender, pale, somewhat compressed and twisted. *Leaves* membranous, oblong or oblong-lanceolate, acuminate at apex, cuneate at base; faintly

crisped-crenulate with large glands in the crenulations; pale and glabrous on both surfaces; glandular dots scattered, in the areoles of the reticulations; 4 to 6 in. long, 1·5 to 2 in. broad; midrib prominent, somewhat impressed above; main-nerves about 12 to 14 pairs, irregular and irregularly spaced, usually starting at an angle of about 60° with the midrib, at first straight, branching and joining in an intramarginal nerve close to the margin and passing through the crenature glands; secondary nerves many, slender, reticulations many, curved; petiole ·4 to ·6 in. long, winged by the decurrent margins of the blade. *Inflorescence* an almost sessile terminal corymb, composed of long-peduncled sub-umbellate racemes; peduncles 1 to 1·5 in.; pedicels ·5 to ·8 in. long; buds conical ·25 in. long. *Calyx-lobes* oblong, obtuse, thin, ·075 in. long, conspicuously dark-brown-gland-dotted; tube short. *Corolla-lobes* ovate, bluntly acuminate, oblique, unequal, conspicuously marked by few dark brown lines and dots, ·3 in. long; tube very short. *Stamens* shorter than corolla-lobes, ·2 in. long, obtusely hastate; anthers opening by broad longitudinal slits, conspicuously black-gland-dotted on back; filaments short. *Ovary* rounded, style slender, ·2 in. long. *Berry* globose, pale, somewhat depressed, ·3 to ·4 in. in diam., conspicuously marked with round or oblong purple dots, somewhat fleshy. Clarke in Hook. f. Fl. Br. Ind. III. 524; Stapf in Trans. Linn. Soc. Ser. 2, IV. 203; Mez Monog. Myrs. 147.

PERAK: *Wray* 1444 at 2,000 feet.—DISTRIB. Assam, Cachar, Manipur, Yunnan, Borneo.

35. ARDISIA WRAYI, King & Gamble, n. sp. A single-stemmed treelet or shrub reaching 5 feet in height, but usually smaller; upper part of stem ·25 in. thick, brown, with spongy bark and scurfy scales; leaf-buds glabrous, lanceolate-acuminate. *Leaves* membranous; oblong-lanceolate, long acuminate at apex, long cuneate at base; margins recurved; somewhat scaly on both surfaces, scurfy along the midrib beneath; glandular dots prominent scattered; broadly crenate, the crenatures shallow with large glands; deep green above, red or purple beneath; 6 to 10 in. long, 1·5 to 3 in. broad; midrib slender; main-nerves 12 to 20 pairs, irregular in angle and distance, curving upwards to and along the margin where they or their branches end in the glands of the crenatures; secondary nerves few, reticulations many scarcely prominent; petiole ·7 to 1·3 in. long, somewhat flattened, bordered by the decurrent margins of the blade. *Inflorescence* of glabrous sub-umbellate racemes from the axils of the uppermost leaves, usually crowded so as to present almost the appearance of a terminal cluster; peduncles usually ·5 in. long, occasionally shorter but often longer, even up to 2 in., flattened; racemes very short, much marked by the scars of very

caducous bracteoles; flowers 8 to 12; pedicels slender below, flattened above, twisted and curved, ·3 to ·4 in. long; buds ovoid. *Calyx-lobes* ovate, acute, ·1 in. long, prominently black-gland-dotted. *Corolla-lobes* waxy, reddish or purple, ovate, ·15 to ·2 in. long, sparsely gland-dotted. *Stamens* nearly as long as corolla-lobes; filaments very short, thick; anthers ovate, acute, connective much gland-dotted on back. *Ovary* rounded; style short, slender, glabrous. *Berry* globose, red, rugose, ·3 in. in diam., prominently gland-dotted when dry.

PERAK: *Wray* 438, 2795, 3280, 4051; *Scortechini* 418; *King's Collector* 1888, 3631, 6938, 7514, in dense jungle on rich soil, both in low-level localities and up to 4,000 feet in the mountains; one specimen, rather more slender, thinner and more glabrous, from the top of rocks (K.C. 7514).

K.C. No. 6938 from mountains at 3,000 to 4,000 feet, has the main-nerves nearly at right angles to the midrib, while other specimens have it at 60° or even 45°; these are, however, intermediate, and all that can be said is that the character is a variable one. The species seems to resemble the *A. macrocarpa*, Wall., of Northern India, in its habit of growth.

36. ARDISIA MINOR, King & Gamble, n. sp. Apparently a short (12 to 18 in. high) treelet or undershrub; lower part of stem with side rootlets; stem ·2 to ·25 in. thick, rusty-pubescent, dark brown. *Leaves* coriaceous; elliptic, long caudate-acuminate at apex, attenuate or cuneate at base often unequally; margins recurved, very shallowly crenate, the crenatures with large prominent glands; glabrous on both surfaces but somewhat scaly; 5 to 7 in. long, 2 to 2·5 in. broad; midrib slender; main-nerves about 15 pairs, starting at an angle of about 50° with the midrib, and thence straight to the margin where they or their branches end in the crenature glands; secondary nerves similar to the main-nerves, reticulations oblique, all raised beneath when dry; petiole thick, rugose, rusty-pubescent, ·7 to 1 in. long, winged by the decurrent margins of the blade. *Inflorescence* of very short, rusty-pubescent, umbellate racemes of about 5 to 6 flowers from the axils of the uppermost leaves; peduncle scarcely ·2 in. long, thick; racemes about ·2 in. long; bracteoles many, ovate or oblong, recurved; pedicels thick, ·3 to ·4 in. long, flattened, recurved. *Calyx-lobes* ovate acute, ·1 to ·15 in. broad, glabrous, prominently gland-dotted, nearly free. *Corolla-lobes* ovate acute, ·2 in. long, glabrous, dotted prominently with large black glands. *Stamens* shorter than corolla-lobes; filaments very short, thick; anthers oblong acuminate, the connective gland-dotted at the back, ·1 in. long. *Ovary* rounded, glabrous; style ·1 in. long, subulate. *Berry* not known.

PERAK: *Scortechini.*

Very near *A. Wrayi*, but differs especially in the coriaceous leaves and the shorter and much thicker pedicels.

37. **ARDISIA PERAKENSIS**, King & Gamble, n. sp. A small bush; branchlets pale brown, smooth, wrinkled when dry; innovations densely rusty-glandular-pubescent. *Leaves* membranous; elliptic-lanceolate, long acute both at apex and base; nearly glabrous on both surfaces but with small peltate scales, young leaves rusty-glandular-pubescent; margin slightly recurved, shortly and shallowly crenate or nearly dentate except on the lower third and at the apex, glands in the crenatures present, obscure; glandular dots absent or very sparse; 2·5 to 4 in. long, ·75 to 1·25 in. broad; midrib slender; main-nerves about 16 pairs, rather irregular in angle and distance, meeting near the margin in an irregularly looped intramarginal nerve, reticulations many, transverse, all raised on lower surface; petiole slender, ·2 to ·4 in. long, bordered by the decurrent margins of the blade. *Inflorescence* of small, 2–3-flowered, rusty-glandular, pubescent, pedunculate umbels from the axils of upper leaves or of reduced bract-like leaves; peduncles ·3 in. long; pedicels ·1 to ·2 in. long; bracteoles ovate, minute; buds ovoid, pale pink. *Calyx-lobes* triangular-ovate, acute, minutely pubescent and gland-dotted, ·05 in. long. *Corolla-lobes* ovate, acute, ·1 to ·15 in. long, glabrous, sparsely black-gland-dotted. *Stamens* a little shorter than corolla-lobes; filaments almost none; anthers ovate, acute, ·1 in. long. *Ovary* rounded, glabrous; style subulate, ·075 in. long. *Berry* not known.

PERAK: at 300 feet in Upper Perak, *Wray* 3462.

38. **ARDISIA MEZIANA**, King & Gamble, n. sp. A herbaceous undershrub, 1 to 2 feet in height, stem 2 in. in diam.; bark soft, pale brown, upper parts and innovations rusty-glandular pubescent. *Leaves* chartaceous; elliptic-obovate, shortly and abruptly acuminate at apex, cuneate at base; glabrous above, sparsely glandular-pubescent beneath; margins rather narrowly crenate-dentate except in the lower third to half and at the acumination, recurved, glands in the crenatures obscure; glandular dots many, scattered, inconspicuous; 3·5 to 5·5 in. long, 1·5 to 2 in. broad; midrib slender; main-nerves 10 to 14 pairs, at an angle of about 60° with the midrib, at first straight afterwards curved upwards to anastomose near the margin; secondary nerves few, reticulations oblique, all more or less raised on both surfaces when dry; petiole ·3 to ·5 in. long, somewhat thickened below, densely rusty-glandular-pubescent. *Inflorescence* of very short, sessile, rusty-glandular-pubescent racemes of about 6 flowers each, in the axils of the leaves all

down the stem, the racemes ·1 to ·15 in. long; bracteoles ovate, scarious, conspicuously black-gland-dotted and ciliate; pedicels short, ·1 to ·15 in. long, stout; buds ovoid; flowers waxy-white. *Calyx-lobes* 5, ovate, acute, ciliate, hyaline, with conspicuous black dots, ·05 in. long; tube as long as lobes. *Corolla-lobes*, ovate, blunt, ·1 in. long, conspicuously black-gland-dotted; tube very short. *Stamens* nearly as long as corolla-lobes; filaments short, thick; anthers ovate-lanceolate, long apiculate, the connective studded on the back with large black glands. *Ovary* rounded, style filiform as long as corolla. *Berry* not seen.

PERAK: on limestone rocks in open jungle at 500 to 800 feet, *King's Collector* 5838.

We have dedicated this well-marked species to C. Mez, whose Monograph of MYRSINEÆ has done so much for the elucidation of the Natural Order, and whose study of *Ardisia* in particular has been of so much help to us.

39. ARDISIA RIDLEYI, King & Gamble, n. sp. A slender shrub or treelet, reaching 10 to 15 feet in height and about 1 in. in diam.; branchlets dark brown, slender, minutely ferruginous-pubescent; leaf-buds lanceolate, densely ferruginous-pubescent. *Leaves* membranous; oblong-lanceolate, long acuminate at apex, acuminate or somewhat rounded at base; prominently crenate, the crenatures usually regular, margin slightly recurved; glabrous on both surfaces; glandular dots few, scattered; 4 to 8 in. long, 1·25 to 1·75 in. broad; midrib slender; main-nerves about 12 pairs, at irregular angles and spaces, ending in the crenatures of the margin; secondary nerves and reticulations obscure; petiole ·2 to ·7 in. long, bordered by the decurrent margins of the blade. *Inflorescence* a 3–6-flowered, sessile, umbellate raceme in the axil of the uppermost leaf of the branchlets; raceme about ·2 in. long; pedicels slender, ·7 to 1·4 in. long, minutely rusty-pubescent; buds ovoid, acute. *Calyx-lobes* 5, broadly triangular, acute, ·075 in. long, sparsely black-gland-dotted, rusty-pubescent. *Corolla-lobes* broadly ovate, acute, ·15 in. long, glabrous, densely and closely black-gland-dotted. *Stamens* a little shorter than the corolla-lobes; filaments very short, thick; anthers oblong, hastate, mucronate, ·1 in. long. *Ovary* rounded, glabrous, style slender, ·05 in. long. *Berry* dark red, ovoid, apiculate, sparsely striate and gland-dotted, ·25 to ·3 in. in. diam.

PERAK: in dense forest at 2,500 to 4,500 feet, *Wray* 209; *King's Collector* 5019. SELANGOR: *Ridley* 8534. SINGAPORE: *Ridley* 6434.

Very like *A. crenata* var. *angusta* but has broader and thinner leaves, differently nerved.

40. ARDISIA CRENATA, Roxb. Hort. Beng. 85 (1814), Fl. Ind. I. 583,

and Fl. Ind. ed. Carey & Wall. II. 276. An evergreen small glabrous shrub; branchlets thick, somewhat fleshy, striate with faint lines decurrent from the bases of the leaves; leaf-buds small, conical. *Leaves* chartaceo-coriaceous; lanceolate to oblong-lanceolate, acute or sub-obtuse at apex, acuminately narrowed at base; margins crispately crenate with glands in the crenatures, recurved; glabrous on both surfaces; glandular dots scattered in the areoles of minor nerves, sometimes prominent, often obscure; 2 to 4 in. long, ·75 to 1·5 in. broad; midrib slender; main-nerves 10 to 14 pairs, irregular, slender, arching upwards and joining in an intramarginal nerve close to the margin which passes through the crenature glands; secondary nerves similar but fainter, reticulations curved; petiole ·2 in. long, narrowly winged by the crisped edges of the decurrent blade. *Inflorescence* of short, sessile or shortly peduncled, panicled racemes, springing from the branchlets just below the terminal pair of leaves; pedicels ·2 to ·4 in. long, slender, longer and thicker in fruit, generally recurved; buds conical, ·15 to ·2 in. long; flowers 4- or 5-merous, waxy pink or white. *Calyx-lobes* ovate, ·05 to ·1 in. long, scarious at the edges, dotted with black glands in the middle; tube very short. *Corolla-lobes* rose-pink, ovate-oblong, bluntly acuminate, ·2 in. long, oblique, unequal, sparsely dotted with round or elongated glands, sometimes papillose at the base within. *Stamens* shorter than corolla-lobes; anthers ovate-oblong, acute, with few glands on the back; filaments very short. *Ovary* ovoid, surmounted by a twisted subulate slender style ·15 in. long. *Berry* globose, ·25 in. in diam., scarlet, succulent, obscurely striate, crowned by the persistent style. Wall. Cat. 2262; Bot. Mag. t. 1950; Clarke in Hook. f. Fl. Br. Ind. III. 524; Koord. & Val. Bijdr. VI. 190. *A. glandulosa*, Bl. Bijdr. 690 (*not of* Roxb.). *A. crenulata*, Lodd. Bot. Cat. t. 2 (*not of* Vent.). *A. crispa*, A. DC. in Trans. Linn. Soc. XVII. 124 and Prod. VIII. 134; Scheff. Myrs. 72; Miq. Fl. Ind. Bat. II. 1020; Kurz in Journ. As. Soc. Beng. XLVI. ii. 226 and For. Fl. II. 113; Mez Monog. Myrs. 144, fig. 22. *A. densa* and *A. polysticta*, Miq. Fl. Ind. Bat. Suppl. 575, 576. *Bladhia crispa*, Thunb. Fl. Jap. 97; Kaempf. Ic. Pl. Jap. t. 7.

KEDAH: *Ridley* 5517. PENANG: *Wallich* 2262; *Maingay* (K.D.) 1009; *Phillips; Curtis* 337; *Deschamps; G. King; J. Scott.* MALACCA: *Griffith* (K.D.) 3583/1; *Cuming* 2254; *Hullett* 637; *Derry* 944. PERAK: *Scortechini; Wray*, 1257; *King's Collector* 1337, 4180, 4903, 7847 8706, 10566. SELANGOR: *Ridley* 10553. PAHANG: *Ridley* 24; *Haviland.* JOHORE: *Fox* 11285.—DISTRIB. Assam, Burma, Sumatra, Java, Borneo, and eastwards to South China and Japan. Ridley (Trans. Linn. Soc. III. (1893) 317) says the berries are "sweet and eatable."

VAR. *angusta*, Clarke, l.c. *Leaves* narrowly lanceolate; flowers in a simple umbellate raceme, pedicels divaricate, buds obtuse.

MALACCA: *Griffith* (K.D.) 3584.

41. ARDISIA ROSEA, King & Gamble, n. sp. A small shrub reaching 4 to 6 feet in height; branchlets divaricate, purplish-brown when dry, glabrous; buds lanceolate. *Leaves* membranous; elliptic, cuspidately acuminate at apex, cuneate at base; broadly crenate with shallow crenatures and prominent glands, the margin recurved; glabrous on both surfaces; glandular dots extremely numerous, prominent on the under surface which is paler than the upper when dry; 2 to 4 in. long, 1 to 1·5 in. broad; midrib slender; main-nerves obscure, 8 to 12 pairs, irregular, branching and usually ending in the crenature-glands; secondary nerves and reticulations indistinct; petiole red, slender, ·25 to ·5 in. long, bordered by the decurrent crisped margins of the blade. *Inflorescence* a corymbiform terminal or pseudo-terminal panicle of umbellate racemes, the branches divaricate, minutely rusty-pubescent; common peduncle, above the last leaf, short, about ·05 in.; branch peduncles slender, ·5 to 1 in. long; pedicels slender, ·2 to ·4 in. long, up to ·5 in. long in fruit, flattened in flower; flowers in each umbel about 12, usually recurved; buds ovoid, acute. *Calyx-lobes* 5, triangular-ovate, ·05 in. long, glabrous, not glandular; tube as long as lobes, lobes reflexed in fruit. *Corolla-lobes* waxy-white tinged with pink, or pink only, ovate-acuminate, ·2 in. long, much twisted to the left, not glandular. *Stamens* nearly as long as corolla-lobes; filaments slender, ·05 in. long; anthers ovate, blunt, ·1 in. long, with very few glands. *Ovary* rounded, glabrous; style filiform, ·15 in. long. *Berry* black, globose, ·25 in. in diam., smooth, tipped with the long slender persistent style.

PERAK: *Wray* 32, 402; *Scortechini* 295, 664; *Ridley* 5511, 9720; *King's Collector* 3247, 6247, 8057; in dense forests in the mountains from 3,000 feet elevation to the top of Gunong Batu at 6,700 feet.

42. ARDISIA LONGEPEDUNCULATA, King & Gamble, n. sp. A shrub; branchlets slender, rusty-pubescent, divaricate. *Leaves* membranous; oblong-lanceolate, long acuminate at apex, attenuate at base; crenulate with shallow glandular crenatures, margin recurved; glabrous on both surfaces, pale beneath when dry; glandular dots many, scattered, prominent on the under surface when dry; 4 to 6 in. long, 1·25 in. broad; midrib slender; main-nerves 12 to 16 pairs, curved upwards to and along the margin usually to end in the crenature-glands; secondary nerves and reticulations obscure; petiole slender, ·5 in. long, bordered by the decurrent crisped margins of the blade. *Inflorescence* a terminal

pyramidal panicle of long-peduncled racemes, 5 to 6 in. long and 6 to 9 in. broad, branches and rachis all rusty-pubescent; common peduncle about 1 in. long; branch peduncles 2 to 3 in. long, at right angles to the rachis and curved upwards; racemes about ·5 in. long, about 8-flowered; pedicels slender, somewhat clavate, twisted, ·5 to 1 in. long; bracteoles subulate, caducous; buds ovoid, acuminate. *Calyx-lobes* triangular, blunt, ·05 in. long, rusty-pubescent; tube as long. *Corolla-lobes* pink, ovate, long acuminate, ·25 in. long, rusty-pubescent within, not gland-dotted; tube very short. *Stamens* much shorter than corolla-lobes; anthers oblong, acute; filaments very short. *Ovary* rounded, style subulate, ·25 in. long. *Berry* purplish-black, globose, ·2 in. in diam.

PERAK: at low levels, *Wray* 296.

43. ARDISIA MAINGAYI, King & Gamble. A "bush or small tree" (Wray), "slender tree" (Scortechini); branchlets smooth, bark brown, pith rather small; innovations glandular-pubescent. *Leaves* membranous; sub-opposite or falsely whorled; elliptic-obovate or obovate-lanceolate, attenuately or abruptly acuminate at apex, attenuately cuneate at base; glabrous on both surfaces except for a few scattered glandular hairs, pale beneath; margin finely toothed except on the lower third, the teeth caudate and glandular; 6 to 11 in. long, 2 to 3·5 in. broad; midrib slender above, thickened below; main-nerves 15 to 20 pairs, irregular in angle and distance, but usually at about 50° with the midrib, straight for about half-way and then curved to and along the margin; secondary nerves and reticulations very faint; petiole none or very short, the base of the leaf almost half stem-clasping. *Inflorescence* of slender, 6 to 8 in. long, sparsely glandular-pubescent, panicles of long peduncled sub-umbellate racemes, from the axils of upper leaves, of abortive leaves, or of the scars of fallen leaves below them; common peduncle slender, 2 to 3 in. long; branch peduncles very slender, divaricate, ·5 to 1·5 in. long, supported by linear subulate ·2 to ·3 in. long bracts; racemes ·3 to ·5 in. long, 8–12-flowered; bracteoles small, subulate; pedicels slender, flattened above; buds ovoid acute. *Calyx-lobes* ovate, obtuse, ·05 to ·1 in. long, recurved in fruit, minutely pubescent, ciliate on the margins. *Corolla-lobes* white, ovate, acute or acuminate, ·15 in. long, glabrous, gland-dotted. *Stamens* much shorter than corolla-lobes; filaments short, dilated at base; anthers oblong, bluntly mucronate, ·1 in. long. *Ovary* rounded, glabrous; style slender, ·05 in. long. *Berry* red, ·3 in. in diam., longitudinally ribbed when dry. *A. odontophylla*, Wall., var. *Maingayi*, Clarke in Hook. f. Fl. Br. Ind. III. 526.

PERAK: *Wray* 304, 953, 1597; *Scortechini* 335, 339; *Curtis*.

MALACCA: *Maingay* (K.D.) 1016, in the mountains about 4,500 feet and below.

Although Wray and Scortechini describe this more or less as a "tree," Maingay's specimen is that of a semi-herbaceous undershrub about 24 in. high, sending out roots from above the ground-level.

44. ARDISIA THEÆFOLIA, King & Gamble, n. sp. A small shrub reaching 3 feet in height; branchlets brown, smooth, the uppermost parts and innovations rusty-glandular-pubescent. *Leaves* chartaceous; elliptic, long acuminate at apex, acuminate at base; alternate or sub-opposite or falsely whorled; minutely glandular-pubescent on both surfaces, scaly beneath; margins recurved, finely toothed except on the lower third and on the acumination, the teeth erect, glandular; glandular dots very numerous and prominent on both surfaces; 2 to 3 in. long, ·7 to 1·2 in. broad; midrib slender; main-nerves 10 to 14 pairs, close, curved upwards to near the margin, reticulations obscure; petiole ·4 in. long, bordered by the decurrent margins of the blade. *Inflorescence* a 1·5 to 2·5 in. long panicle with short racemose branches in the axil of a leaf or of a subulate ·2 in. long linear abortive leaf between the leaves on the upper part of the branches; branches ·5 in. long, slender, divaricate; bracteoles minute, linear; flowers 2 to 5 in each raceme, buds ovoid. *Calyx-lobes* 5, rounded, ·05 in. long, ciliate. *Corolla-lobes* 5, white, ovate, acute or obtuse, ·15 in. long, gland-dotted. *Stamens* as long as corolla-lobes; filaments very short; anthers broadly oblong, mucronate. *Ovary* rounded, gradually produced in an erect or curved style, ·1 in. long. *Berry* pyriform or nearly globose, ·2 in. in diam., smooth, slightly ribbed when dry.

PERAK: on Ulu Batang Padang at 4,900 feet, *Wray* 1513; *Scortechini.*

45. ARDISIA ODONTOPHYLLA, Wall. Cat. 2279 (1829) (*not of* Lindl.); A. DC. Trans. Linn. Soc. XVII. 125, t. VI., Prod. VIII. 135; Clarke in Hook. f. Fl. Br. Ind. III. 525; Mez Monog. Myrs. 150. *A. pavonina*, Herb. Hamilt. *fide* DC. in Prod. l.c.—DISTRIB. India (Assam and Cachar).

VAR. *Lobbii*, Clarke in Hook. f. Fl. Br. Ind. III. 526. An almost herbaceous undershrub reaching to about 2 feet in height, the stems rooting from nodes near the base; bark fleshy, pale brown; pith large; upper part of stem densely fulvous-villous; leaf-buds small, short. *Leaves* membranous, sub-opposite; elliptic or elliptic-oblong or obovate-lanceolate, acute at apex, cuneate at base and sometimes slightly rounded; the margins sharply serrate except for a short distance near the base; glabrous above except on the hirsute midrib, rusty-tomentose beneath, the midrib and main-nerves usually ferruginous-villous on the lower surface; glands scattered, not prominent; 4 to 8 in. long, 1·5 to 3·5 in. broad; midrib thick, prominent; main-nerves 8 to 12 pairs, prominent, irregular in distance and angle, curving upwards to and along the margin; secondary nerves few, reticulations transverse; petiole variable, stout, ·4 to 1 in. long, ferruginous-villous, rarely glabrescent. *Inflorescence* of short (under 1 in. long) lax, few-flowered, pubescent, simple or compound, umbellate racemes, from the axils of leaves below the summit or of a linear subulate abortive leaf about ·5 in. long; peduncles slender, ·5 to 2 in. long; pedicels slender, ·3 to ·7 in. long, recurved; bracteoles short, subulate; buds ovoid. *Calyx-lobes* ovate, obtuse, ciliate, ·1 in. long, slightly pubescent, marked with faint brown striæ; tube short. *Corolla-lobes* pink, ovate, obtuse or bluntly acuminate, ·15 to ·2 in. long, unequal, marked with many light brown linear and round glands; tube short. *Stamens* half the length of the petals; anthers broad, oblong, ·1 in. thick, emarginate; filaments very stout. *Ovary* ovoid, gradually narrowed into a slender subulate style ·1 in. long, the top of the ovary and base of the style short pubescent. *Berry* globose, scarlet, fleshy, ·25 in. in diam., smooth.

PERAK: *Wray* 2285, 2975; *King's Collector* 2583, 2978, 3053, 7367. SELANGOR: *Ridley* 7560. PAHANG: *Ridley* 2270, 5825. SINGAPORE: *Lobb* 316, an undershrub of dense forests in wet localities.

Ridley's Pahang specimens have smaller leaves and longer calyx-lobes, with fewer-flowered inflorescences, the whole plant more thickly fulvous-villous, but do not seem capable of separation.

46. ARDISIA BAMBUSETORUM, King & Gamble, n. sp. A small semi-herbaceous shrub 1 to 2 feet high; stem pale brown about ·25 in. in diam., bark spongy, pith large. *Leaves* membranous; oblong or oblong-lanceolate or obovate-oblong, acute at apex, narrowly attenuate at base and slightly rounded; glabrous on both surfaces, slightly scaly only beneath; glands few, scattered, chiefly near the margin; margins very briefly and irregularly toothed, usually recurved; 4 to 6 in. long, 1 to 1·5 in. broad; midrib slender; main-nerves 8 to 10 pairs, starting at an angle of about 50° with the midrib, curved upwards, and often branching, to and along the margin, where they anastomose in a rough intramarginal nerve; secondary nerves few, reticulations oblique; petiole ·4 to ·6 in. long, channelled above. *Inflorescence* of lateral pedunculate racemes 1 to 1·5 in. long supported by a linear abortive leaf ·5 in. long; peduncle ·7 to ·8 in. long, raceme the same; bracteoles small subulate about ·1 in. long; pedicels slender, clavate, ·4 to ·5 in. long recurved; buds ovoid; flowers white.

Calyx-lobes 5, linear-oblong, acute, reflexed, ·05 to ·07 in. long, not gland-dotted. *Corolla-lobes* ovate-oblong, ·15 in. long, dotted with elongated brown glands. *Stamens* shorter than the corolla-lobes; filaments short; anthers oblong, obtuse, emarginate, ·1 in. long. *Ovary* rounded, glabrous; style slender, curved, ·1 in. long. *Fruit* not seen.

PERAK: in dense bamboo forest, *King's Collector* 10095.

This is scarcely more than a var. of *A. odontophylla*, but is recognised by the somewhat different leaves, white flowers, glabrous ovary and style, and the absence of fulvous tomentum.

6. ANTISTROPHE, A. DC.

Slender shrubs, with puberulous branchlets. *Leaves* alternate, entire or dentate, lanceolate, acuminate, glandular, petiole margined. *Flowers* hermaphrodite, in sub-sessile axillary umbels or solitary, pedicels slender, bracts small. *Calyx* small, 5-lobed, persistent; lobes acute, imbricate. *Corolla* deeply 5-cleft; lobes lanceolate acuminate, overlapping to the left in bud. *Stamens* 5, inserted on the throat of the corolla; filaments short; anthers free, hastate-lanceolate, the connective produced upwards in a membranous tip, cells dehiscing longitudinally and introrsely. *Ovary* ovoid, attenuated in a filiform style, stigma punctiform; ovules many on a globose central placenta. *Fruit* a globose berry, pericarp coriaceous, endocarp chartaceous. *Seed* 1, albumen ruminated; embryo cylindric, transverse.—DISTRIB. Species 4, Indian and Malayan.

Inflorescence 1–2-flowered, glabrous; leaves caudate acuminate ..	1. *A. caudata.*
Inflorescence 4–6-flowered, hirsute; leaves short acuminate ..	2. *A. Curtisii.*

1. ANTISTROPHE CAUDATA, King & Gamble, n. sp. A shrub or small tree; branches smooth, divaricate, nearly glabrous; branchlets puberulous, with faint raised lines from the bases of the leaf-petioles; innovations rusty-pubescent. *Leaves* membranous; elliptic-lanceolate, caudate-acuminate at apex, attenuate or somewhat rounded at base; entire or undulate on the margins; glabrous on the upper, minutely puberulous or glabrous and with pale peltate scales on the lower, surface; glandular dots very many, scattered, prominent; 3 to 4 in. long, 1 to 2 in. broad; midrib slender, conspicuous below; main-nerves 8 to 12 pairs, prominent beneath, at an angle of about 60° with the midrib, arching upwards, forking and obscurely anastomosing near the margin, the lowest pair of nerves more oblique than the rest; secondary nerves short, slender, reticulations indistinct; petiole ·1 to ·2 in. long, edged by the decurrent margins of the blade which are almost connivent above. *Inflorescence* of short, axillary, usually only 1–2-flowered sub-

sessile umbels, with very minute bracts; pedicels slender, clavate, ·4 in. long; buds conical, long acuminate, ·3 in. long, glabrous. *Calyx-lobes* ovate, acute, ·05 in. long, ciliate on the edges, gland-dotted in two central lines. *Corolla-lobes* ovate, long-caudate-acuminate, ·3 in. long, glabrous, dotted with few elongate glands. *Stamens* inserted at the base of the corolla-lobes and nearly as long as them (·25 in.); anthers sagittate-lanceolate with prominent rows of glands on the back, connective produced upwards in a membranous tip. *Ovary* ovoid, glabrous; style subulate, ·25 in. long, very slender. *Berry* globose, ·25 in. in diam., smooth, obscurely vertically striate.

PERAK: at Gunong Batu Pateh, 3,400 feet, *Wray* 456, 978, 3242; *Curtis* 3324.

This species at first sight resembles *A. oxyantha*, A. DC., of North-East India, but has smaller and differently-veined leaves, with different glands and smaller flowers.

2. ANTISTROPHE CURTISII, King & Gamble, n. sp. A shrub (?); branchlets round, rusty-glandular-hirsute, zigzag, with faint raised lines from the bases of the petioles of the leaves; innovations densely rusty-glandular-hirsute. *Leaves* membranous; elliptic or elliptic-oblong, acuminate at apex, rounded at base, entire; nearly glabrous above except on the midrib, sparsely rusty-hirsute beneath; 3·5 to 5 in. long, 1·5 to 2 in. broad; midrib slender, raised beneath; main-nerves about 10 pairs, at about an angle of 50° with the midrib, curved upwards, forked and broadly anastomosing near the margin, lowest pair not more oblique than the others; secondary nerves and reticulations obscure; petiole ·2 in. long, crispedly channelled above. *Inflorescence* of densely rusty-hirsute, sub-sessile, axillary, 4–6-flowered, umbellate racemes, ·1 to ·15 in. long; bracteoles subulate, ·05 in. long; pedicels slender, ·3 to ·5 in. long; buds caudate-acuminate, ·3 in. long. *Calyx-lobes* linear subulate, ·1 in. long, densely rusty-hirsute. *Corolla-lobes* ovate at base, long caudate-acuminate, ·3 in. long, scarcely dotted, 3–5-nerved, sparsely hirsute without. *Stamens* rather shorter than the corolla-lobes, connivent in a cone; anthers sessile, lanceolate sagittate, the back with 2 rows of prominent round or elongate glands, the connective produced in a blunt membranous tip. *Ovary* ovoid, style slender, as long as anthers. *Berry* not seen.

PERAK: in Kuran Valley, below the gap, 4,000 feet, *Curtis* 3390.

7. ÆGICERAS, Gaertn.

Sea-coast shrubs, or small trees; branches cylindric, glabrous. *Leaves* scattered, petioled, entire, glabrous, alternate. *Flowers* large (for the Order) white, pedicellate, without bracteoles, in terminal or axillary umbels or panicles, pedicels slender. *Calyx* 5-lobed; lobes obtuse, coriaceous, twisted to the left, overlapping to the right; tube none. *Corolla* with short tube; lobes 5, acute, overlapping to the right in bud, afterwards recurved. *Stamens* 5, inserted on the corolla-tube; filaments elongate, connate into a tube below; anthers with transversely septate cells, cordate-lanceolate, introrse, dehiscing longitudinally. *Ovary* fusiform, narrowed into an elongated style; stigma acute; ovules many, immersed in a central globose placenta. *Fruit* cylindric, curved, acute, coriaceous, 1-seeded; pericarp coriaceous, afterwards splitting, testa membranous. *Seed* elongate, exalbuminous; radicle inferior, enlarged at the base, joined with the cotyledons into a cylindric tube; germination often taking place while still on the plant, as in some *Rhizophoreæ*.—DISTRIB. Two species, of the sea-coasts of India, Burma, the Malay Peninsula and Islands, to South China and tropical Australia.

ÆGICERAS MAJUS, Gaertn. Fruct. I. 216, t. 46, fig. 1 (1788). A shrub or small tree reaching 15 to 20 feet in height, evergreen, all parts glabrous; branches greyish-black, smooth; branchlets reddish. *Leaves* coriaceous; obovate, rounded obtuse or emarginate at apex sometimes even obcordate, cuneate at base, margins recurved; glandular dots many, inconspicuous; 1·5 to 3·5 in. long, 1 to 1·5 in. broad; midrib slender, raised above or sometimes depressed; main-nerves about 10 pairs, slender, raised above, straight at first then curving upwards; secondary nerves slender, few, reticulations not prominent; petiole ·2 to ·3 in. long, thick, bordered by the decurrent margins of the blade. *Inflorescence* a terminal, axillary or leaf-opposed many- (15 to 20) flowered umbel, sessile or very short peduncled; bracts oblong-lanceolate, deciduous; pedicels slender, ·3 to ·5 in. long; buds conical. *Calyx-lobes* concave, gibbous at the base, broadest at top, ·25 in. long, ·15 in. broad, with parallel veins and scattered black dots in the lower part. *Corolla-lobes* ovate, acuminate, glabrous, parallel-veined, ·25 in. long, recurved; tube as long as lobes, villous hairy within. *Stamens* longer than corolla-lobes, exsert; filaments connate half-way up, linear, connate part densely villous, free part glabrous ·2 in. long; anthers ·1 to ·15 in. long, dorsifixed, cells prominently septate. *Ovary* ovoid, surmounted by a subulate angular style, ·3 in. long, black-gland-dotted below. *Fruit* a long acuminate pale brown capsule, up to 3 in. long, ·25 in. in diam., glabrous. *Seed* 1, elongate, filling the capsule, embryo inverse, funicle very long. Willd. Sp. Pl. I. 1185; Roem. & Schult. Syst. Veg. IV. 511; Roxb. Fl. Ind. III. 130; A. DC. in Ann. Sc. Nat. 2, XVI. t. 9A, and Prod. VIII.

142; Wight Icon. t. 146; Miq. Fl. Ind. Bat. II. 1031; Scheff. Myrs. 97; Benth. Fl. Austral. IV. 277; Dalz. & Gibs. Bomb. Fl. 137; Bedd. Fl. Sylv. CXXXIX. Anal. pl. XIX. III.; Clarke in Hook. f. Fl. Br. Ind. III. 533; Trimen Fl. Ceyl. III. 74; Cooke Fl. Bomb. II. 88; Koord. & Val. Bijdr. V. 276; Pax in Engl. & Prantl Pflanzenfam. IV. i. 97, fig. 57; Schimp. Strandfl. 44, figs. 1, 2; Prain Beng. Pl. 645. *Æ. fragrans*, Koenig Ann. of Bot. I. 129, t. 3; Wall. Cat. 2326; Wight in Hook. Bot. Misc. III. 84, t. 21. *Æ. minus*, A. DC. l.c. 142. *Æ. Malaspinæa*, DC. l.c. 143. *Æ. obovatum*, Blume Bijdr. 693. *Æ. corniculatum*, Blanco Fl. Filip. 79; Kurz in Journ. As. Soc. Beng. XLVI. II. 227 and For. Fl. III. 114; Mez Monog. Myrs. 55, fig. 8. *Rhizophora corniculata*, Linn. Sp. Pl. Ed. 3 (1764), 635. "*Pou-Kandel*," Rheede Hort. Mal. VI. 36. *Mangium fruticosum corniculatum*, Rumph. Herb. Amb. III. 117.

PENANG: *Wallich* 2326; *Curtis* 52, 513. PERAK: *King's Collector* 4961. MALACCA: *Maingay* (K.D.) 1017; *Griffith* (K.D.) 3538. SINGAPORE: *Ridley* 2801A, 3632A.—DISTRIB. Sea-coast of India from Sind to Ceylon, the Sundarbans, Burma, and the Andaman Islands; eastwards to the Malay Islands, South China, the Philippines and Australia. One of the coast plants included under the general name of "Mangroves."

Order LXXI. SAPOTACEÆ.

Trees or shrubs, with milky juice, generally evergreen, young parts often rusty-tomentose. *Leaves* alternate, rarely sub-opposite, coriaceous or rarely membranous, entire, penniveined, stipules none or very caducous. *Flowers* usually hermaphrodite, small or medium-sized, solitary or fascicled in the axils of the leaves, sometimes (*Sarcosperma*) paniculate; bracts and bracteoles very small or wanting. *Calyx* inferior, persistent or deciduous; lobes 4 to 8, much imbricate, occasionally biseriate with the outer ones valvate. *Corolla* gamopetalous; tube short, campanulate or urceolate; lobes as many as, or 2 to 4 times as many as, those of the calyx. *Stamens* inserted on the corolla-tube in 1 to 2 series and opposite to them, sometimes alternating with staminodes; filaments short, erect; anthers ovate-lanceolate or linear-sagittate, 2-celled, the connective sometimes produced. *Disk* hypogynous, often inconspicuous or wanting. *Ovary* superior, sessile, often villous, 2–5- or more celled; style shortly conical or elongate-subulate, glabrous; stigma terminal, punctiform; ovules solitary in the cells, attached to the inner angle. *Fruit* an indehiscent, 1–8-seeded berry, pericarp usually fleshy. *Seeds*, if solitary, conform to the fruit; if more than one compressed, ellipsoid; hilum conspicuous; testa usually crustaceous, shining; embryo straight, exalbuminous with fleshy cotyledons, or albuminous with flat cotyledons; radicle inferior, usually small.—Distrib. About 320 species, in the tropical regions of the whole world, genera about 24.

Calyx-lobes 1-seriate, imbricate; stamens 5 to 6:—	
Staminodes none	1. Chrysophyllum.
Staminodes present:—	
Flowers sessile or in panicles	2. Sarcosperma.
Flowers in axillary fascicles	3. Sideroxylon.
Calyx-lobes 2-seriate, outer series valvate:—	
Calyx segments 4:—	
Seeds albuminous:—	
Stamens 8	4. Isonandra.
Stamens 12 or more	5. Payena.
Seeds exalbuminous, stamens 12 or more	6. Bassia.
Calyx segments 6 to 8:—	
Staminodes none, seeds exalbuminous	7. Palaquium.
Staminodes present, seeds albuminous	8. Mimusops.

1. CHRYSOPHYLLUM, Linn.

Trees with milky juice. *Leaves* coriaceous, glabrous or pubescent on the under-surface, main-nerves usually very many, thin; stipules none. *Flowers* small, in axillary fascicles, usually hermaphrodite. *Calyx* 5–7-lobed; lobes subequal, imbricate. *Corolla* tubular-campanulate or sub-rotate, 5–7-lobed; lobes imbricate, entire. *Stamens* equal in number with, and opposite to, the corolla-lobes, attached to the tube or the base of the lobes; filaments subulate or filiform; anthers ovate or triangular, extrorse or laterally dehiscing; staminodes none. *Ovary* villous, 5-, rarely 6–7-celled, style glabrous; ovules one in each cell, attached to the central placenta. *Fruit* a fleshy or coriaceous berry, globose, 5-celled or less by abortion. *Seeds* large; testa very hard, dull or shining; hilum conspicuous; embryo as large as the seed, erect, cotyledons flat in fleshy albumen, radicle inferior.—Distrib. About 60 species, chiefly tropical American, a few only in Asia, Africa and Australia.

Chrysophyllum Roxburghii, G. Don Gen. Syst. IV. 33 (1837). A slender, erect tree reaching 40 to 60 ft. in height, evergreen; branches horizontal; bark smooth, grey; young branchlets and innovations ferruginous-pubescent. *Leaves* coriaceous, glabrous, alternate; oblong-lanceolate, suddenly caudate-acuminate at the apex which is sometimes obtuse, cuneate at base and unequal, undulate on the margins; 3 to 6 in. long, 1·25–2 in. broad; midrib slender, prominent beneath; main-nerves very numerous, parallel, nearly at right angles to midrib, meeting in an intramarginal nerve; secondary nerves similar, reticulations slanting; petiole thick, ·25 in. long, pubescent. *Flowers* small, in rounded axillary fascicles; pedicels slender, ·1 to ·2 in. long, ferruginous-pubescent. *Calyx-lobes* 5, ovate, glabrous or pubescent outside, thick, ciliate on the margins, ·07 to ·1 in. long; tube short. *Corolla* tubular-campanulate, ·1 in. long; lobes 5, short, ciliate on the margins. *Stamens* 5, shorter than the corolla, opposite the corolla-lobes and inserted on the base of the tube; filaments slender; anthers ovate, apiculate and ending in a minute tuft of hairs, extrorse, slits somewhat lateral. *Ovary* rounded, obscurely 5-lobed, surrounded by a thick tuft of long ferruginous hairs; style thick, cylindro-conical, glabrous; cells 5. *Fruit* a globose or obscurely 5-lobed berry 1 to 1·5 in. in diam., strongly 5-lobed when dry, ferruginous-tomentose when young afterwards smooth, yellowish-green, with thick glutinous pulp. *Seeds* ·6 in. long, ·5 in. broad, flattened, the outer edge curved, the inner nearly straight; hilum oblong, conspicuous, pale; testa very hard, thick, shining, chestnut-brown; embryo erect, cotyledons flat, ·4 in. broad, ovate, obtuse, 3-nerved; radicle large, cylindric. A. DC. Prod. VIII. 162; Clarke in Hook. f. Fl. Br. Ind. III. 535; Bedd. Fl. Sylv. t. 236; Kurz For. Fl. II. 118 and in Journ. As. Soc. Beng. XLVI. ii. (1877) 228; Trimen Fl. Ceyl. III. 76; Dalz. & Gibs. Bomb. Fl. 138; Cooke Bomb. Fl. II. 88; Burck Ann. Gard. Buit. V. i. (1886), 4; Koord. & Val. Bijdr. I. 130. *C. acuminatum*, Roxb. Fl. Ind. I. 599; Wall. Cat. 4160 (*not of* Lamk.). *C. lanceolatum*, A. DC. l.c.; Miq. Fl. Ind. Bat. II. 1035. *C. javanicum*, Steud. Nom. Ed. II. i. 359. *Nycteristition lanceolatum*, Bl. Bijdr. 676.

MALACCA: *Griffith* (K.D.) 3600; *Maingay* (K.D.) 980; *Goodenough* 1739. SINGAPORE: *Ridley* 2756, 5837.—DISTRIB. British India; Burma; Java; Sumatra.

Curtis No. 1072, collected at Batu Ferengy, Penang, and now in the Kew Herbarium, seems to be a new species of *Chrysophyllum*. The *leaves* are chartaceous, lanceolate, acuminate at both ends, glabrous, shining, 2 to 4 in. long, ·75 to 1 in. broad, the veins indistinct. *Flowers* unknown. *Fruit* a fleshy berry, ·5 in. in diam., 5-lobed when dry, glabrous. *Seeds* ·4 in. long, ·25 in. broad, rounded on the outside, narrowed and somewhat concave within; testa hard, dark chestnut-brown, shining; hilum narrow. It might be called *C. Curtisii*, n. sp., King & Gamble.

2. SARCOSPERMA, Hook. f.

Glabrous trees. *Leaves* coriaceous or chartaceous, opposite and alternate, oblong; stipules caducous. *Flowers* small, sessile or fascicled on the branches of a simple or compound panicle, sessile or shortly pedicellate; bracteoles minute. *Calyx-lobes* 5, rounded, sub-equal, much imbricate. *Corolla* broadly campanulate; tube short; lobes 5, rounded, entire, much imbricate. *Stamens* 5, inserted on the tube of the corolla and opposite to its lobes; filaments very short; anthers obtuse, laterally or extrorsely dehiscing. *Staminodes* 5, small, subulate or rounded. *Ovary* glabrous, 1–2-celled; style short; stigma somewhat lobed, capitate. *Fruit* an ellipsoid berry, 1–2-seeded; pericarp coriaceous, scarcely thick. *Seeds* 1–2; testa crustaceous; hilum nearly basal; albumen none; embryo fleshy.—DISTRIB. Species 3, in North-East India, Burma, Malaya and S. China.

SARCOSPERMA PANICULATUM, Stapf & King in Hook. f. Ic. Plant. t. 2690 (1901). A tree, reaching 50 to 70 feet in height and 18 to 20 in. in diam.; branchlets thick, dark brown, glabrous. *Leaves* chartaceous; sub-opposite, elliptic-oblong, bluntly acuminate at apex, acute or rounded or often rhomboid at base; glabrous on both surfaces, nearly black when dry; 4 to 8·5 in. long, 1·5 to 3 in. broad; midrib slender; main-nerves 7–8 pairs, slender, distant, often nearly 1 in. apart, starting at an angle of about 60° with the midrib and at once curving upwards to and along the margin; secondary nerves many and, like the transverse reticulations, inconspicuous; glandular pits in the axils of most of the main-nerves; petiole ·5 to ·7 in. long, channelled above and with two minute rounded auricles below the blade. *Flowers* solitary or clustered on the branches of a leafy compound panicle of racemes, the racemes often 2 in. long; bracteoles minute, triangular; pedicels rarely reaching ·05 in. in length, stout; buds globose. *Calyx-lobes* 5, imbricate, rounded, usually 3 larger with somewhat scarious margins, 2 smaller thicker and slightly acute, shortly campanulate. *Corolla-lobes* 5, closely imbricate, rounded, glabrous, ·05 in. long, the margins revolute; tube as long as lobes. *Stamens* 5, inserted on the top of the tube; filaments very short; anthers ovate, rounded, introrse, or laterally dehiscing. *Staminodes* alternating with the stamens, minute, nearly orbicular, crenulate. *Ovary* conical, furrowed; style very short, thick, stigma capitate, minutely 2–4-lobed. *Fruit* drupaceous, ellipsoid, seeds, 1–2. *Bracea paniculata*, King in Journ. As. Soc. Beng. LXIV. ii. 101.

PERAK: *Scortechini; King's Collector* 7970, 8086, 10284, 10554, 10672, 10835; among large bamboos, on river-banks, or in mixed forest.

3. SIDEROXYLON, Linn.

Trees or shrubs, sometimes armed, with milky juice. *Leaves* coriaceous or thinner, entire, alternate; stipules none. *Flowers* small, in fascicles in the axils of the leaves or of the scars of fallen leaves, sub-sessile or shortly pedicelled. *Calyx* of 5–6 imbricate, usually orbicular and obtuse segments. *Corolla* campanulate, or tubular-campanulate, with 5 or rarely 6 lobes, the lobes imbricate. *Stamens* as many as the corolla-lobes and opposite to them, attached to the tube or at its base; filaments linear, usually short; anthers ovate or lanceolate; staminodes alternating with the stamens, lanceolate. *Ovary* usually villous, with 5 or fewer cells; style cylindric; stigma small; ovules erect, placentas axile. *Fruit* an ovoid or globose fleshy berry, 5- or less-seeded, usually with one seed only. *Seeds* compressed, generally solitary; testa hard, crustaceous, usually shining; hilum oblong or linear; embryo erect, cotyledons flat or thickened, in fleshy albumen; radicle short, inferior.—DISTRIB. About 60 species, mostly of tropical regions in both hemispheres, a few only extratropical in South Africa or Australasia.

Leaves more than 3 in. broad, yellowish when dry, main-nerves very prominent .. .. 1. *S. malaccense.*
Leaves under 3 in. broad, green or brown when dry:—
  Leaves nearly glabrous, membranous, obovate-acuminate .. 2. *S. Maingayi.*
  Leaves pubescent beneath, at least on the nerves:—
    Corolla-tube longer than the lobes; leaves elliptic, grey-silky beneath .. .. 3. *S. Derryanum.*
    Corolla-tube shorter than the lobes:—
      Leaves obovate, main-nerves not very prominent or regular .. .. 4. *S. ferrugineum.*
      Leaves oblong-lanceolate, main-nerves very prominent and regular .. .. 5. *S. firmum.*

SPECIES IMPERFECTLY KNOWN: 6. *S. Wallichianum.*

1. **SIDEROXYLON MALACCENSE**, Clarke in Hook. f. Fl. Br. Ind. III. 537 (1882). A large tree, reaching 40 to 60 feet in height; branches pale brown; ultimate branchlets ferruginous-pubescent, as are the leaf-buds and young leaves. *Leaves* coriaceous; often, not always, crowded towards the ends of the branchlets; obovate-oblong, rounded or shortly acute at apex, somewhat cuneate at base; deep-green above, pale bluish-green beneath, yellow when dry, densely rusty-pubescent beneath when young, glabrous on both surfaces when old except for rusty hairs on the midrib and main-nerves beneath; 6 to 8 in. long, 3 to 4·5 in. broad; midrib very thick and prominent; main-nerves 8–14 pairs, very prominent, starting at about an angle of 60° with the midrib, parallel at first, ultimately arched upwards; reticulations not prominent, obliquely joining the main-nerves; petiole 1 to 1·5 in. long, thick, enlarged at base, bordered above by the slightly decurrent margins of the blade. *Flowers* fasciculate, shortly pedicelled, in the axils of the leaves, above

the scars of fallen leaves or on the year-old wood below the leaves and shoots of the year; pedicels ·1 to ·2 in. long, rusty-tomentose. *Calyx-lobes* 5, imbricate, ·15 to ·2 in. long, densely rusty-pubescent without, rounded. *Corolla* tubular-campanulate, ·15 in. long, absent in ♀ flowers; lobes very short, obtuse, imbricate. *Stamens* attached to the base of the corolla-tube; anthers ovate, apiculate, opening by side-slits; staminodes linear-lanceolate. *Ovary* thickly rusty-pubescent, flattened at top, obscurely 5-lobed, 5-celled; style cylindric. *Berry* fleshy, somewhat oblong, rounded, tipped with the persistent style, thickly covered with velvety orange-red tomentum and about ·5 in. in diam. *Seeds* not accurately known.

PENANG: *Curtis* 1452. PERAK: *Wray* 136; *King's Collector* 6550. MALACCA: *Maingay* (K.D.) 994; *Holmberg* 704. SINGAPORE: *Ridley* 6130, 6499; *Cantley* 89.

Mr. Cantley says that this tree gives the true "Daru-daru" or "Dedâru" wood of the Malay Peninsula.

2. SIDEROXYLON MAINGAYI, Clarke in Hook. f. Fl. Br. Ind. III. 536 (1882). A tree with rusty-pubescent branchlets and young shoots. *Leaves* membranous; crowded towards the ends of the branchlets; obovate, shortly acuminate at apex, cuneate at base; rusty-pubescent when young, glabrous when old or rusty-pubescent on the midrib and main-nerves; 4 to 8 in. long, 1·5 to 3 in. broad; midrib prominent; main-nerves 8 to 11 pairs, starting at an angle of nearly 60° to the midrib, at first parallel then arching upwards to near the margin; transverse reticulations more or less parallel; petiole 1 to 1·5 in. long, bordered by the decurrent margins of the blade. *Flowers* fasciculate, sessile or with very short pedicels, chiefly on the previous year's wood below the leaves and shoots of the year. *Calyx-lobes* 5, imbricate, rounded, rusty-pubescent without, ·075 to ·1 in. in diam. *Corolla* tubular-campanulate, as long as or rather shorter than the calyx, wanting in ♀ flowers; lobes very short, obtuse, imbricate. *Stamens* short; filaments slender; anthers ovate; staminodes linear-lanceolate. *Ovary* thickly rusty-pubescent, flattened at top; style cylindric. *Berry* fleshy, 1·5 in. in diam., ovoid or globular, full of guttapercha. *Seeds* 4, compressed, ·7 in. long by ·3 to ·35 in. broad; rounded outside, nearly straight within, the long narrow oblong hilum covering nearly the whole margin; testa hard, shining, dark chestnut-brown; albumen firm, white; cotyledons plane, appressed, elliptic; radicle inferior.

NEGRI SEMBILAN: *Ridley* 10084. MALACCA: *Maingay* (K.D.) 993; *Hervey*. SINGAPORE: *Ridley* 8928, 9223.

The fruit description is chiefly taken from Maingay's notes in the Kew Herbarium.

3. Sideroxylon Derryanum, King & Gamble, n. sp. A tree; branchlets grey, uppermost appressed-pubescent; innovations with nearly black hairs. *Leaves* chartaceous; elliptic, very abruptly short-acuminate at apex, broadly cuneate at base; margins more or less recurved; glabrous above, densely silvery-pubescent beneath; 3 to 5·5 in. long, 1·5 to 3 in. broad; midrib prominent, impressed above; main-nerves 12 to 18 pairs, parallel, starting at an angle of about 75° with the midrib, meeting near the margin in a faint intramarginal looped nerve; secondary nerves similar, rather prominent, reticulations few, obscure; petiole ·3 to ·5 in. long, channelled above, pubescent with nearly black hairs. *Flowers* fascicled, about 5 together in the axils of the leaves or of the scars of fallen leaves; pedicels ·25 in long, tawny-pubescent; buds oblong, conical. *Calyx-lobes* 5, rounded, obtuse, the 2 outer thick very pubescent, the 3 inner somewhat scarious, pubescent only on the middle of the back. *Corolla* campanulate, ·2 in. long; tube ·15 in. long, glabrous within, with a few sparse hairs without; lobes 5, ovate, imbricate, margins recurved. *Stamens* 5, short, inserted at the top of the tube; filaments conical; anthers ovate-cordate, dehiscing by side-slits; staminodes subulate, glabrous. *Ovary* villous, obscurely 5-lobed, 5-celled; style very short; stigma obscurely 5-lobed. *Berry* oblong, dark blue, glabrous, the top flat and crowned with the remains of the style, ·6–·7 in. long, 1-seeded. *Seed* oblong, ·6 in. long by ·3 in. in diam. truncate obliquely at the base; testa thick, light-brown, striate; hilum rather small, sub-basal; albumen thin; cotyledons thick; radicle small.

Perak: *Derry-Curtis* 3641.

The colour of the silvery under-surface of the leaves is difficult to describe—it is sometimes dark and smoky-looking.

4. Sideroxylon ferrugineum, Hook. & Arn. Bot. Beech. Voy. 266, t. 55 (1841). A small tree; branches rough, ultimate branchlets ferruginous-pubescent like the leaf-buds and young leaves, branchlets with a raised line downwards from each leaf or scar of a fallen leaf. *Leaves* coriaceous; obovate or oblong-lanceolate, rounded or bluntly acute at apex, attenuate at base; shining above, densely appressed ferruginous-silky beneath when young, ultimately nearly glabrous; 2·5 to 6 in. long, 1 to 3 in. broad; midrib prominent; main-nerves 10 to 12 pairs, fairly prominent, especially above, starting at about an angle of 60° with the midrib, at first nearly parallel then arching upwards to meet near the margin; secondary nerves similar, reticulations oblique; petiole ·5 to ·7 in. long, the edges bordered by the decurrent margins of the blade, enlarged at base. *Flowers* fasciculate, shortly pedicelled, in the axils of

the leaves or above the scars of fallen leaves on year-old wood below the leaves and shoots of the year; pedicels ·1 to ·2 in. long, covered like the obtuse buds with rusty tomentum. *Calyx-lobes* round, ·025 to ·075 in. in diam., with scarious margins, closely imbricate, rusty-pubescent outside. *Corolla* campanulate, ·1 in. long; tube short; lobes 5, imbricate, rounded, crenulate, sparingly pubescent near the base within, in ♀ flowers wanting or deciduous. *Stamens* very short, attached to the corolla-tube above the base; filaments linear; anthers rounded, opening by marginal slits; staminodes subulate or somewhat hastate, acuminate. *Ovary* depressed, obscurely 5-lobed, pubescent; stigma short, cylindric, with 5 minute punctiform styles. *Berry* ovoid, shining ·35 by ·3 in., 1–2-seeded. *Seeds* ovoid, ·25 by ·15 in.; testa shining, dark brown, thick; hilum large, oblong; albumen thick; cotyledons flat. A. DC. Prod. VIII. 178; Clarke in Hook. fil. Fl. Br. Ind. III. 537. *S. attenuatum*, A. DC. l.c.; Wight Ic. t. 1590; Kurz For. Fl. II. 117, and in Journ. As. Soc. Beng. XLVI. ii. (1877) 229. *Mimusops ? attenuata*, Wall. Cat. 4150.

KEDAH: Langkawi, *Curtis*. PENANG: *Curtis* 273, 703, 704. PERAK: *Scortechini* 1463; *King's Collector* 1224. MALACCA: *Maingay* (K.D.) 982; *Griffith* (K.D.) 3604; *Goodenough* 1735. SINGAPORE: *Wallich* 4150; *Lobb* 319; *Ridley* 5643, 5908. A sea-shore tree, found also by Ridley on Tiuman Island and at Kwala Pahang (Trans. Linn. Soc. Ser. 2. III. 317).—DISTRIB. Burma, Andaman Islands, Nicobar Islands, Malay Archipelago to the Philippines and S. China.

5. SIDEROXYLON FIRMUM, Pierre; Burck in Ann. Jard. Buit. V. 17, tab. III. (1885). A small tree; branchlets thick, striate, brown; innovations ferruginous-pubescent. *Leaves* coriaceous; oblong-lanceolate, shortly acuminate at apex, narrowly acute at base; glabrous above, rusty-pubescent on the nerves beneath and on young leaves; margins recurved; 4 to 5 in. long, 1 to 1·5 in. broad; midrib strong, prominent, impressed above; main-nerves 12 to 16 pairs, very prominent, about ·2 to ·3 in. apart, starting at an angle of about 40° with the midrib, parallel, curved near and along the margin; reticulations transverse, very regular and prominent; petiole 1 to 1·5 in. long, channelled above and bordered by the decurrent margins of the blade, rusty-pubescent. *Flowers* fascicled, 4 to 6 together in the axils of the leaves; pedicels variable, ·3 to ·6 in. long, rusty-pubescent, slender in flower, thickened in fruit. *Calyx*-lobes 5, rounded, imbricate, ·15 in. long, densely rusty-pubescent, 3 outer thick, 2 inner more or less scarious on the margins. *Corolla* campanulate, ·15 in. long, 5-lobed, glabrous within, slightly hairy without; tube rather short; lobes oblong, rounded. *Stamens* inserted on the top of the tube; filaments glabrous; anthers ovate-apiculate;

staminodes subulate, about ·05 in. long. *Ovary* villous; style clavate, glabrous. *Fruit* an oblong or somewhat obovoid berry, depressed at apex, glabrous, fleshy, supported by the somewhat enlarged persistent calyx-lobes, seed usually 1. *Seed* oblong, obtuse above, somewhat pointed below, little compressed, ·6 in. long, ·25 in. broad and thick; testa chestnut-brown, shining, crustaceous; hilum linear, flat, occupying nearly the whole inner face of the seed; albumen thick; cotyledons leafy, flat, oblong, 3-nerved; radicle inferior, pointed. *Chrysophyllum firmum*, Miq. Fl. Ind. Bat. Suppl. 579.

PENANG: at West Hill, *Curtis*, 1575.—DISTRIB. Bangka, *Teysmann*; Philippines.

The Bangka specimens have the leaves up to 2·5 in. broad, but in other respects we find no difference from Teysmann's type in the Penang plant.

SPECIES IMPERFECTLY KNOWN.

6. SIDEROXYLON WALLICHIANUM, G. Don Gen. Syst. IV. 28 (1837). A tree (?); branchlets pale brown, ferruginous-villous as are the innovations. *Leaves* chartaceous; elliptic-obovate, obliquely acuminate at apex, cuneate at base, crowded towards the ends of the branchlets; 6 to 8 in. long, 3 to 4 in. broad; midrib thick; main-nerves 6 to 7 pairs, curved upwards, distant, reticulations prominent; petiole thick, densely tawny-pubescent. *Calyx-lobes* apparently 5, short, rounded, rusty-pubescent. Miq. Fl. Ind. Bat. II. 1037. *S.* (?) *rugosum*, Wall. Cat. 4158.

The only sheet of this is in the type Herbarium of Wallich's plants with the Linnean Society of London. The remains of flowers are very slight, but they seem to show that the plant belongs to this genus. The note "a small plant growing on crocks—flowers white—from the hills" attached to the sheet, seems to refer to some other plant, for the specimen itself has every appearance of having come from a tree.

4. ISONANDRA, Wight.

Trees with milky juice. *Leaves* coriaceous, entire, alternate, penniveined, the main-nerves and midrib prominent, the rest usually rather obscure. *Flowers* small, in axillary shortly pedicellate clusters in the axils of present or fallen leaves. *Calyx* of 4 segments, the two outer opposite, more or less valvate; the two inner also opposite, imbricate. *Corolla* tubular, campanulate; lobes 4, much imbricate, somewhat twisted. *Stamens* 8, sub-equal, attached near the base of the corolla, both opposite to and alternate with the lobes; filaments short; anthers lanceolate, sagittate at base, extrorse; staminodes absent. *Ovary* 4-celled, villous; style linear. *Berry* somewhat small, ovoid or oblong with a fleshy pericarp. *Seed* usually 1 only, scarcely flattened; testa thick, shining, crustaceous; hilum lateral, long; albumen fleshy, cotyledons flat, radicle inferior.—DISTRIB. About 7 species, 6 of which in South India and Ceylon.

1. ISONANDRA PERAKENSIS, King & Gamble, n. sp. A small tree reaching 30 to 40 feet in height; ultimate branchlets, leaf-buds and young leaves appressed greyish-brown-pubescent. *Leaves* coriaceous; obovate-oblong, rounded at the apex, cuneate sometimes unequally at the base; the margins reflexed, glabrous and dull above, thickly brown-pubescent beneath; 2 to 3·5 in. long, 1 to 1·5 in. broad; midrib prominent; main-nerves 8 to 10 pairs at about 60° with the midrib, reticulations very inconspicuous; petiole ·2 to ·3 in. long, rather stout. *Flowers* fasciculate, on very short, ·1 in. long, thick, angular pedicels in the axils of upper leaves; buds ·15 in. long, obtuse, brown-appressed-pubescent. *Calyx* of 4 lobes, an outer pair and an inner pair, the outer valvate, the inner shining within, minutely ciliate; lobes ·15 in. long. *Corolla* 4-lobed; lobes rounded, about equal to the tube, together about equal to the calyx. *Stamens* 8, filaments thickened; anthers lanceolate, sagittate at base, extrorse. *Ovary* slightly hairy, conical, surmounted by a short linear style as long as the calyx; cells 4. *Berry* oblong, acute, smooth, ·4 to ·5 in. long. *Seeds* ellipsoid, acute at apex, scarcely flattened, ·35 by ·15 in.; hilum large, oblong; testa dark brown, hard, smooth, shining; albumen fleshy; embryo large, cotyledons oblong.

PERAK: at 1,000 to 1,500 feet elevation, *King's Collector* 7138.

DOUBTFUL SPECIES.

2. ISONANDRA RUFA, King & Gamble, n. sp. A small tree, reaching 20 to 30 feet in height and 4 to 6 in. in diam.; younger branchlets and innovations densely ferruginous pubescent. *Leaves* membranous; obovate, long acuminate sometimes abruptly at apex, cuneate and finally more or less rounded at base; sparsely pubescent above when young, nearly glabrous when old; roughly pubescent beneath, especially on the nerves; 5 to 7 in. long, 1·5 to 2·5 in. broad; midrib prominent; main-nerves 8 to 10 pairs, irregularly distanced, at first at an angle of about 45° with the midrib, then arching upwards; secondary nerves and reticulations prominent; petiole ·3 in. long, slender, rusty-pubescent, channelled above; stipules very short, subulate, rusty-pubescent, very caducous. *Flowers* solitary or in pairs in the axils of the upper leaves or on the upper branchlets, very small; pedicels slender, ·25 in. long, recurved. *Calyx-lobes* 4, densely ferruginous-pubescent; 2 outer valvate, ovate, ·2 in. long; 2 inner imbricate, ovate, somewhat scarious and ciliate on the margins. *Corolla* tubular-campanulate; ·2 to ·25 in. long; tube slender, minutely

hairy without and near the mouth within; lobes 6 (?), linear oblong, ·1 in. long, erect. *Stamens* 6 (?), ·1 in. long; filaments very slender, villous; anthers ovate, penicillate-apiculate. *Ovary* rounded, glabrous; style slender, curved, ·2 in. long. *Fruit* an oblong berry, about 1 in. long and ·5 in. broad. *Seed* 1, testa thin, shining.

PERAK: *Scortechini* 159; *King's Collector* 4550, in dense jungle at 500 to 800 feet.

In only one flower were any traces found of the corolla and stamens, and there seemed to be 6 corolla-lobes instead of 4, and 6 stamens instead of 8. We consider it best, however, to leave the species here for the present and until better material is available.

5. PAYENA, A. DC.

Trees with milky juice. *Leaves* membranous or chartaceous, often silky beneath; stipules caducous. *Flowers* fascicled, rather few together, in the axils of the leaves on the upper part of the branchlets, pedicellate. *Calyx-lobes* 4, the 2 outer usually valvate enclosing the 2 inner generally imbricate. *Corolla* campanulate; tube broad, short; lobes 8, imbricate, in one or two series. *Stamens* 16, inserted on the corolla-tube; filaments short; anthers usually extrorse, ovate to linear, connective produced in an acumen; staminodes none. *Ovary* villous, usually 8-celled; style linear-subulate. *Fruit* an oblong or ovoid fleshy berry, few-seeded. *Seeds* oblong, usually somewhat compressed; testa crustaceous, shining; hilum oblong or linear, conspicuous; albumen thin; cotyledons leafy, thin, flat, nearly as long and broad as the cavity of the seed; radicle inferior, generally rather conspicuous.—DISTRIB. About 6 to 7 species, found in the Malay Peninsula and Archipelago.

Flowers large, reaching ·75 in. in length:—
  Leaves 6 to 9 in. long, silky-pubescent beneath.. .. 1. *P. Maingayi.*
  Leaves 4 to 5 in. long, glabrous on both surfaces .. 2. *P. longipedicellata.*
Flowers medium-sized or small, under ·75 in. in length:—
  Flowers in fascicles near the ends of the branchlets, having the appearance of a terminal inflorescence:—
    Flowers moderate-sized, berry obpyriform, acuminate at tip .. .. 3. *P. Havilandi.*
    Flowers small, berry oblong conical, truncate at tip .. 4. *P. Leerii.*
  Flowers in fascicles in the axils of the leaves, never apparently terminal:—
    Leaves glabrous, pedicels slender, flowers small .. 5. *P. lucida.*
    Leaves ferruginous-pubescent, pedicels short, flowers rather large .. .. 6. *P. dasyphylla.*

SPECIES IMPERFECTLY KNOWN.

Leaves sessile .. .. 7. *P. sessilis.*

Leaves petiolate :—	
Leaves under 4 in. long, obovate or elliptic-obovate, more or less obtuse	8. *P. obtusifolia.*
Leaves over 4 in. long, oblong-lanceolate, acuminate ..	9. *P. selangorica.*

1. **Payena Maingayi**, Clarke in Hook. f. Fl. Br. Ind. III. 547 (1882). A large guttapercha-yielding tree, reaching 80 feet in height and a considerable girth ; branchlets dark brown, smooth, younger branchlets and innovations rusty-tomentose ; leaf-buds golden pubescent, scales ·2 to ·3 in. long, lanceolate. *Leaves* chartaceous ; oblong, acuminate at the apex sometimes caudately sometimes abruptly, cuneate at the base ; glabrous above except on the midrib, covered beneath with a silky golden-brown pubescence, afterwards glabrate ; 6 to 9 in. long, 2 to 3 in. broad ; midrib prominent, minutely pubescent above or glabrous ; main-nerves 20 to 25 pairs, ·3 to ·5 in. apart, starting at an angle of about 70° with the midrib, at first parallel, ultimately ending in a looped intramarginal nerve ; secondary nerves between the main-nerves, obscure like the reticulations ; petiole 1 in. long, bordered above by the decurrent margins of the blade ; stipules linear, subulate, ·3 in. long, golden-pubescent, quickly caducous. *Flowers* fascicled, 2 to 6 together in the axils of the leaves ; pedicels slender, ·75 in. long, up to 1 in. in fruit and then thickened, clavate, brown-pubescent. *Calyx*-lobes 4, ·4 to ·5 in. long, densely brown-pubescent outside ; outer pair valvate, ovate-acute, thick ; inner pair imbricate, concave, keeled, acuminate, rather thin. *Corolla* white, campanulate, ·6 to ·8 in. long, glabrous ; tube about ·2 in. long ; lobes 8, lanceolate, in 2 rows, the outer 4 enclosing the inner 4. *Stamens* 16, inserted on the top of the tube, ·25 in. long ; filaments thick ; anthers as long as filaments, ovate, extrorse, crowned by a long mucro formed by the produced connective, the mucro ciliate or truncate or bifid at the apex. *Ovary* ovoid, pubescent, tapering into a subulate ·8 in. long style, cells 8. *Fruit* an oblong, golden-pubescent or nearly glabrous berry up to 1·5 in. long by ·8 in. broad, crowned by the remains of the persistent style, and supported by the persistent calyx-lobes, seeds 1 to 2. *Seeds* oblong, convex on one side, somewhat concave on the other, 1 to 2 in. long by ·5 in. broad and ·2 in. thick ; testa light brown, shining, crustaceous ; hilum conspicuous, slender ; albumen thin ; cotyledons oblong rounded, ·8 in. long by ·225 in. broad ; radicle rather large, inferior. Pierre in Bull. Linn. Soc. Par. I. 526. *Chrysophyllum ? molle*, Wall. Cat. 4161.

PENANG : *Curtis* 1565. PERAK : *Scortechini* 172, 346 ; *Wray* 3423 ; *King's Collector* 7223, 7918 ; in open jungle or rich soil from 300 up to 2,000 feet. MALACCA : *Griffith* (K.D.) 3610 ; *Maingay* (K.D.)

990; *Curtis* 3483. SINGAPORE: *Ridley* 6239, 6497. Curtis says it is the "Taban Percha" of the Malays.

The drawing of the flower in Engl. & Prantl Naturl. Pflanzen-Fam. IV. i. 132, fig. 69 A–C seems a little doubtful. The identification of Wall. Cat. 4161 seems also doubtful, for *Payena Maingayi* much resembles in leaf *Palaquium Gutta* var. *oblongifolia*.

2. PAYENA LONGIPEDICELLATA, Brace MS. in Herb. Calc. A tree, reaching 100 to 130 feet in height; branches slender, silvery-grey, innovations rusty-pubescent. *Leaves* chartaceo-coriaceous; oblong or elliptic-oblong, shortly acuminate at apex, rounded unequally at the base; glabrous on both surfaces, margins slightly recurved; 4 to 5 in. long, 1·5 to 2 in. broad; midrib slender, impressed above; main-nerves about 18 pairs, indistinct, starting at about 85° with the midrib, at first parallel, near the margin joined in an intramarginal looped nerve; secondary nerves nearly as prominent as main-nerves, often branching backwards, reticulations few, indistinct; petiole ·7 to ·8 in. long, channelled above and bordered by the margins of the decurrent blade; stipules small, ovate-acute, rusty-pubescent, very caducous. *Flowers* fascicled, 1–3 together, in the axils of lower leaves or of the scars of fallen leaves; pedicels 1 to 1·5 in. long, slender, curved, striate when dry, clavate above, puberulous; flower-buds conical, large. *Calyx-lobes* 4; 2 outer valvate, ovate-acute, thick, ·5 in. long, sparsely rusty-pubescent; 2 inner lanceolate-acuminate, concave, thickly keeled, ·6 in. long, densely tawny-pubescent on the back. *Corolla* tubular-campanulate, ·8 in. long; tube ·3 in. long, glabrous; lobes 8, 4 outer enclosing 4 inner, ovate-acuminate, glabrous. *Stamens* 16, inserted in 1 row, below the top of the tube but alternate ones covered by the others; filaments very short, slender; anthers ·15 in. long, ovate, rusty-hirsute, extrorse, the connective produced in a broad mucro divided in 2 diverging lobes at the tip. *Ovary* oblong, style a little longer than the corolla-lobes. *Fruit* not known.

PERAK: *King's Collector* 2940.—DISTRIB. Borneo, *Haviland* 3035.

3. PAYENA HAVILANDI, King & Gamble, n. sp. A large tree (?); branchlets grey, slender, innovations appressed rusty-pubescent. *Leaves* chartaceo-coriaceous; elliptic, abruptly acuminate at apex, attenuate usually unequally at base; glabrous above, glabrous beneath except on the midrib which is appressed-rusty-pubescent, margins recurved; 2·5 to 3 in. long, 1·25 to 1·75 in. broad; midrib slender; main-nerves 10 to 12 pairs, not very prominent, rather irregular, starting at about an angle of 60° with the midrib, meeting close to the margin in an intramarginal looped nerve; secondary nerves and reticulations scanty but prominent, raised beneath; petiole ·4 to ·5 in. long,

channelled above and bordered by the decurrent margins of the blade; stipules small, ovate-falcate, densely ferruginous-pubescent. *Flowers* fascicled, 3–4 together, in the axils of upper leaves or of terminal leafless branchlets, giving the appearance of a terminal corymbose inflorescence; pedicels ·8 to 1 in. long, densely rusty-pubescent, recurved; buds ovate, ·25 in. long, obtuse. *Calyx-lobes* 4, outer pair rounded, thick, appressed pubescent to nearly glabrous; inner pair thinner, scarious, ciliate. *Corolla* campanulate, ·3 to ·4 in. long, longer than the calyx, glabrous; lobes 8, oblong, cordate at base, crenate or ciliate on the margins, veined; tube as long as lobes. *Stamens* 16, usually in 2 rows; filaments slender, glabrous; anthers ovate, the connective broad and produced in a broad glabrous acumen, sharp in bud, flattened later on. *Ovary* linear-oblong; style slender, ·5 in. long. *Fruit* an obpyriform fleshy berry, 1·5 in. long and ·75 in. broad, surmounted by the persistent conical style, seed 1. *Seed* oblong, 1 in. long, ·6 in. broad, flattened; testa crustaceous, shining, chestnut-brown; hilum narrow, elongated; albumen thick; cotyledons broadly oblong, ·5 in. long, nerved; radicle rather large, nearly ·15 in. long.

KEDAH: Lankawi Island, *Ridley* 8329. PENANG: *Curtis* 777. SINGAPORE: *Ridley* 4959, 9203.—DISTRIB. Borneo, *Haviland* 2098, 2320.

P. CROIXIANA, Pierre in Bull. Soc. Linn. Par. I. 524 seems to be this species or very near it. The following is Pierre's description:—

A huge tree. *Leaves* oval or sub-oblong, long acuminate, glabrous; 2–3 in. long, ·3 in. broad; main-nerves 24 to 28, petiole ·25 in. *Flowers* 3, axillary, sub-terminal; peduncles ·2 to ·3 in. long, ·6 in. in fruit. *Sepals* ovate, ciliate. *Corolla-tube* pubescent without; lobes oblong, truncate at the apex, ciliate; filaments very short; anthers sub-oblong with a long connective, obtuse, pilose on both sides. *Ovary* 8-celled, tomentose, urceolate at the base of the style. *Berry* oblong, ·8–1·2 in. long, ·5–·6 in. broad, glabrous, 1-seeded; pericarp ·06 in. thick; hilum under ·04 in. broad, laterally extended over the whole height; cotyledons ·8 in. long; ·02 in. broad, radicle ·14 in. long.

MALACCA: St. Pol Lias; Mad. Errington de la Croix in Paris Mus. "*Sundek.*"

4. PAYENA LEERII, Benth. & Hook. f.; Pierre in Bull. Soc. Linn. Par. i. 524 (1885). A tree, reaching 80 to 100 feet in height and a considerable girth; branchlets grey, slender; innovations minutely rusty-pubescent. *Leaves* chartaceous; elliptic, abruptly acuminate at apex, acute or somewhat rounded at base; upper surface glabrous, shining, lower surface sparsely pubescent to glabrous; margins undulate, recurved; 2 to 4 in. long, 1 to 2 in. broad; midrib prominent, impressed

above; main-nerves 14 to 18 pairs, slender, about ·2 in. apart, inconspicuous, more or less parallel, starting at an angle of about 80° with the midrib, straight almost to the margin where they are connected by a looped intramarginal nerve; secondary nerves many, forking backwards, reticulations faint; petiole slender, ·75 in. long, channelled above by the decurrent margins of the blade; stipules short, subulate, pubescent, very caducous. *Flowers* fascicled, 3–4 together, in the axils of upper leaves, or on terminal leafless branchlets, giving the impression of a terminal inflorescence; pedicels slender, ·4 in. long, pubescent. *Calyx-lobes* 4, ·15 in. long, the 2 outer ovate-valvate, minutely pubescent; the 2 inner ovate, truncate at apex, almost scarious on the margins, pubescent, imbricate. *Corolla* campanulate; tube ·05 in. long, glabrous; lobes 8, imbricate, the 4 rather smaller outer embracing the 4 larger inner, ovate-obtuse, ·15 in. long. *Stamens* 16, inserted in one row on the top of the corolla-tube, those opposite the lobes longer than and behind those alternate with them; filaments very short, hairy; anthers ovate, ·075 in. long, extrorse, the connective produced in a rather thick penicillate mucro. *Ovary* villous, depressed, obscurely 8-lobed; style subulate, glabrous above, pubescent below, ·2 in. long; cells 8. *Fruit* an ovate-oblong conical reddish-green berry, 1·5 to 1·75 in. long, obscurely ribbed and rough, at first tipped with the conical remains of the style, afterwards truncate seed 1. *Seed* 1 in. long, about ·4 in. broad, oblong; testa thin crustaceous, dark brown; hilum long, narrow; albumen thin; cotyledons oblong, ·85 in. long, ·35 in. broad, faintly 3-nerved; radicle small, inferior. Kurz in Journ. As. Soc. Beng. XL. (1871) II. 69; Burck in Ann. Jard. Buit. V. (1885) 56, tab. VIII.; Engl. and Prantl Pflanzenfam. IV. i. 133, fig. 70. *Keratephorus Leerii*, Hassk. Retzia I. (1856) 101; Miq. Fl. Ind. Bat. II. 1039. *Azaola Leerii*, Teysm. & Binnend. in Nat Tijdschr. Neerl. Ind. VI. 116.

PERAK: *Wray* 1539, at 4,900 feet on Batang Padang; *King's Collector* 523. SINGAPORE: *Cantley* 20.—DISTRIB. Sumatra, Bangka, Borneo (?), Amboina. *Vern.* "Getah Sundek." It gives a second-rate variety of guttapercha.

To this species probably belong *Ridley* 11313, *Curtis* 3631, and *David* 10857, all apparently from Sumatra—*Vern.* "Getah Sundi." The specimens have leaves only.

Curtis' No. 3640 "Getah Sundek" from the Dindings is either this species or *P. Havilandi;* but the fruit is globose, not elongate or obconical. It seems, however, to have been more or less attacked by insects, and may not show its proper shape.

5. PAYENA LUCIDA, A. DC. Prod. VIII. 197 (1844). An evergreen tree

reaching a height of 60 feet and considerable girth; branchlets slender, dark brown, innovations rusty-tomentose. *Leaves* chartaceous; elliptic, elliptic-oblong or elliptic-lanceolate, obtusely and rather abruptly caudate-acuminate at apex, acute at base and unequal-sided; glabrous on both surfaces, the margins slightly recurved; 4 to 5 in. long, 1·5 to 2 in. broad; midrib prominent, slender; main-nerves 10 to 12 pairs, not prominent, rather irregular, ·3 to ·4 in. apart, starting at an angle of about 60° with the midrib, straight at first, arching near the margin to meet in a looped intramarginal nerve; secondary nerves and reticulations rather scanty; petiole ·4 in. long, channelled above; stipules very minute, linear, silky-pubescent, caducous. *Flowers* fascicled, 1 to 4 together, in the axils of upper leaves; pedicels slender, ·7 to ·8 in. long, somewhat clavate, minutely silky; buds conical, ·1 to ·2 in. long. *Calyx-lobes* 4, 2 outer valvate, thick, enclosing 2 inner, broad, ovate, obtuse, ciliate, often scarious on the margins, ·2 in. long. *Corolla* white, campanulate, ·2 to ·3 in. long; tube short; lobes 8, oblong, obtuse or rounded in 2 rows, 4 outer enclosing 4 inner. *Stamens* 16, ·12 in. long; filaments short, thick; anthers ovate, the connective produced into an obtuse, glabrous, often bifid acumen, cells extrorse. *Ovary* villous, rounded; style subulate, glabrous, ·3 in. long, 6-celled. *Fruit* an oblong, ferruginous-pubescent berry, 1 to 1·5 in. long, ·7 in. broad, 1-seeded. *Seed* oblong, bluntly acute at both ends, flattened, ·8 in. long, ·5 in. broad, ·3 in. thick; testa chartaceous, chestnut-brown, shining; hilum about ·15 in. broad occupying the whole inner edge; albumen thick; cotyledons oblong, thin, flat, faintly nerved as the leaves, ·6 in. long, ·4 in. broad; radicle rather large, inferior. Kurz For. Fl. II. 121, Journ. As. Soc. Beng. XL. ii. 69, and XLVI. ii. 230; Clarke in Hook. f. Fl. Br. Ind. III. 547; Pierre in Bull. Soc. Linn. Par. I. 525. *Mimusops lucida*, Wall. Cat. 4147; G. Don Gen. Syst. IV. 35 (*not of* Poir.).

PENANG: *Wallich* 4147. PERAK: *Scortechini* 1989; *Wray* 2266, 3114, 3191, 3482; *King's Collector* 3364, 3734, 6636. SINGAPORE: *Lobb* 307; *Ridley*.

VAR. *Wightii*, Clarke in Hook. f. Fl. Br. Ind. III. 548. *Leaves* large, up to 6 in. long and 2·5 broad, coriaceous; pedicels stout; sepals large, rusty-tomentose. *Payena polyandra*, Bth. & Hook. f.; Pierre in Bull. Linn. Soc. Par. I. 526. *Isonandra polyandra*, Wight Ic. t. 1589. *Keratephorus Wightii*, Hassk. in Retzia I. 101.

Of this variety Clarke makes two forms, which he distinguishes chiefly by the former having short acuminations to the leaves, the latter long acuminate leaves. We have separated the material into these two groups as well as we can.

Form (1): Leaves up to 6 in. long, 2·5 in. broad, abruptly acuminate, shining above, ferruginous-red beneath when dry; flower-buds ovoid, ·2 in. long or more, rusty-pubescent. Pedicels stout, clavate; fruit oblong, depressed at top; anther-connective not so broad as in *P. lucida.*

MALACCA: *Griffith* (K.D.) 3605 (*part*); *Maingay* (K.D.) 194; *Hervey*; *Derry* 937; *Holmberg* 794; *Goodenough* 1977. PERAK: *King's Collector* 8705.

Form (2): Leaves up to 6 in. long, oblong-lanceolate, long-acuminate, reddish beneath when dry; nerves more prominent than in *P. lucida;* pedicels slender, ·8 to 1·2 in. long; buds ovoid, sometimes flattened, ·2 to ·3 in. long, rusty-pubescent; young fruit oblong conical, tipped by the persistent style; old fruit oblong, over 1 in. long. *P. costata*, King MS. in Herb Calc.

MALACCA: *Griffith* (K.D.) 3605 (*part*); *Maingay* (K.D.) 989; *Goodenough* 1853; *Derry* 654; *Curtis* 3644, 3660. PENANG: *Curtis* 1516. PERAK: *King's Collector* 3734, 4081, 7842, 7957, 10466, 10496, 10978. PAHANG: *Ridley* 2672. SELANGOR: *Goodenough* 10545. SINGAPORE: *Ridley* 3995, 5070, 6508, 11305.

VAR. *nigra*, King & Gamble. *Leaves* much larger than in the specimens of true *P. lucida*, elliptic, long caudate-acuminate at apex, more or less rounded at base, undulate on the margins, 6 to 8·5 in. long, 2·5 to 4 in. broad; main-nerves and intramarginal nerve very prominent, raised beneath; flower-buds and pedicels often golden-pubescent. *Flowers* as in *P. lucida.*

PERAK: *Wray* 1170; *Scortechini.*

P. LOWIANA, Pierre in Bull. Soc. Linn. Par. I. 524, seems to be one of the varieties of *P. lucida* or a species allied to it. The following is Pierre's description:—

A huge tree. *Leaves* with petiole ·4 in. long; blade 5 in. long, 1·2–1·6 in. broad, oblong-lanceolate, obtusely acuminate, glabrous; main-veins 24, distant. *Fruiting peduncles* axillary, 1–1·2 in. long, solitary. *Berry* oblong, 1·3 in. long by ·8 in. broad, sub-glabrous, crowned at the top with the remains of the style. *Seed* solitary, 1·1 in. long, ·35 in. in diam., erect; hilum lateral, ·08 in. broad; cotyledons oblong, attenuate at the apex, ·8 in. long by ·2 in. broad; radicle ·15 in. long. *P. lucida* MS. in Herb. Mus. Par.

PERAK: *Sir Hugh Low*; *St. Pol Lias* No. 272.

6. PAYENA DASYPHYLLA, Pierre in Bull. Soc. Linn. Par. I. 527 (1885). A large tree, reaching 80 to 100 feet in height and considerable girth; branches spreading, branchlets greyish-brown, moderately thick; innovations densely ferruginous-pubescent. *Leaves* membranous; oblong or elliptic-oblong or obovate-oblong, often unequal-sided; acuminate at apex, acute, cuneate or somewhat rounded at base; glabrous above except on the midrib and near the base, densely ferruginous-pubescent beneath, when old nearly glabrous; 4 to 8 in. long, 1·5 to 3 in. broad; midrib thick, pubescent on both surfaces; main-nerves 12 to 16 pairs, unequally spaced, starting at about 60° with the midrib, produced straight to meet a looped intramarginal nerve; secondary

nerves rather prominent, reticulations irregular; petiole ·5 in. long, thick, densely rusty-pubescent, channelled above; stipules subulate, rusty-pubescent, short, early caducous. *Flowers* fascicled, 1 to 3 together, in the axils of the leaves; pedicels thickly rusty-pubescent, ·4 to ·6 in. long, somewhat enlarged in fruit; buds ovoid. *Calyx-lobes* 4, 2 outer thick, valvate, ·3 in. long, triangular-rounded, densely rusty-pubescent; 2 inner concave, slightly imbricate, ·35 in. long, thickly keeled, scarious on the margins and ciliate, rusty-pubescent around the keel. *Corolla* tubular-campanulate, ·3 in. long; tube ·1 in. long, glabrous; lobes 8, the 4 outer enclosing the 4 inner but inserted in one row, oblong, obtuse. *Stamens* 16, ·175 in. long, inserted on the top of the tube; filaments ·05 in. long, villous; anthers nearly linear, extrorse, the connective produced in a ·05 in. long, blunt or even bifid acumen. *Ovary* conical, villous as is the base of the ·35 in. long subulate style. *Fruit* an ovoid densely tawny-pubescent berry ·75 to 1 in. long, umbonate at the tip and crowned with a portion of the style. *Seeds* ·4 to ·5 in. long, elliptic-acute; testa dark brown, shining; hilum narrow; albumen thin. Burck in Ann. Jard. Buit. V. 51. *Isonandra dasyphylla*, Miq. Pl. Jungh. 201 and Fl. Ind. Bat. II. 1038; de Vriese Journ. Bot. Neerl. I. 256.

PERAK: *Scortechini* 1242; *King's Collector* 2611, on Larût Peak at 3,000 to 3,500 feet.—DISTRIB. Sumatra, Java.

De Vriese says the gutta is only used for adulteration, but that Motley did not agree in this belief.

VAR. *glabrata*, King & Gamble. Lower surface of the leaves nearly glabrous, apex abruptly long-acuminate; pedicels ·8 to 1 in. long; fruit nearly spherical.

PERAK: *Scortechini* 536. SINGAPORE: at Selitar, *Ridley* 5644.

7. PAYENA SESSILIS, King & Gamble, n. sp. A tree (?); branchlets grey, rough, uppermost somewhat angular when dry. *Leaves* coriaceous, sessile; obovate, obtuse or emarginate; glabrous on both surfaces, margins recurved; 2 to 4 in. long, 1 to 1·5 in. broad; midrib prominent, raised on both surfaces; main-nerves not prominent on the upper surface, raised on the lower, about 8 pairs, at about 50° with the midrib, straight but soon anastomosing with the prominent reticulations which are also raised on the lower surface; stipules ovate, acute or obtuse, glabrous, caducous. *Flowers* fascicled, 2 to 3 together, on small tubercles in the axils of upper leaves; pedicels slender, black, ·5 in. long, supported by small hard glabrous bracts. *Calyx-lobes* in fruit 4, ·2 in. long, ovate-acute, glabrous; rest of flower not seen. *Fruit* a globose glabrous berry, black when dry, prominently surmounted by the

persistent long curved style; cells apparently 4 to 6. *Seeds* oblong, obtuse at top, acute at base, ·3 to ·4 in. long, rounded on the outer, straight on the inner side; hilum long, narrow; testa thin crustaceous, brown; albumen rather thin; cotyledons oblong, flat, ·15 to ·2 in. in length; radicle rather large,

SINGAPORE: *Ridley* 5076.

8. PAYENA OBTUSIFOLIA, King & Gamble, n. sp. A tree; branchlets stout, greyish-brown, prominently marked by the scars of fallen leaves and the tubercles of fallen flower fascicles, young branchlets and leaves rusty-brown in colour. *Leaves* coriaceous; clustered at the ends of the branchlets, obovate or elliptic-obovate, obtuse, emarginate or shortly acute at apex, cuneately attenuate at base; glabrous on the upper surface, rusty-coloured and sometimes pubescent on the lower; 2·5 to 3 in. long, 1 to 1·5 in. broad; midrib stout, main-nerves 10 to 12 pairs, starting at about 60° with the midrib, slightly curving upwards, inconspicuous above as are the reticulations; petiole ·5 to ·75 in. long, channelled above by the decurrent margins of the blade *Flowers* fascicled, 4 to 8 together (to judge by scars only) in the axils of the leaves, or of the scars of fallen leaves; pedicels ·5 in. long, clavate, pubescent; buds about ·3 in. long, truncate. *Calyx-lobes* 4, 2 outer valvate, ovate-acute, ·3 in. long, pubescent; 2 inner imbricate, ovate, golden-pubescent on the back, ciliate on the margins. *Corolla* not seen. *Ovary* ovoid-conical, glabrous, 8-celled; style ·35 in. long, linear. *Fruit* not seen.

PERAK: *Scortechini* 340.

9. PAYENA SELANGORICA, King & Gamble, n. sp. A tree (?); branchlets dark brown, rough. *Leaves* chartaceo-coriaceous; oblong-lanceolate, acuminate at apex, narrowly attenuate at base, glabrous above, slightly pubescent on the sides of the midrib beneath; 4 to 6 in. long, 1 to 1·7 in. broad; midrib prominent, impressed and keeled above; main-nerves about 16 pairs, indistinct, parallel, at about 80° with the midrib, straight at first, anastomosing near the margin with the secondary nerves and reticulations, which are visible but not prominent; petiole ·5 to ·7 in. long, channelled above, enlarged at base. *Flowers* fascicled, 2 to 3 together, in the axils of the leaves; pedicels rather thick, ·6 to ·8 in. long, striate, appressed rusty-pubescent. *Calyx-lobes* 4, outer pair valvate ·3 in. long, ovate-acute, thick below, thinner above; inner pair ovate, ·25 in. long, scarious on the margins; both appressed rusty-pubescent; rest of flower not seen. *Ovary* pubescent, cylindrical, depressed at top; fruit immature, seed apparently albuminous, with an elongated hilum.

SELANGOR: *Ridley* 7387.

6. BASSIA, Linn.

Trees with milky juice. *Leaves* coriaceous or chartaceous, often clustered at the ends of the branchlets; stipules caducous. *Flowers* fascicled, in the axils of the leaves or of the scars of fallen leaves, pedicellate, pedicels frequently reflexed. *Calyx-lobes* 4, the 2 outer usually valvate, enclosing the 2 inner imbricate. *Corolla* campanulate; tube broad; lobes 6 to 12, contorted in bud, erect in flower, imbricate. *Stamens* twice the number of the corolla-lobes or more, inserted in one or more rows on the corolla-tube; filaments usually short; anthers generally lanceolate, laterally or extrorsely dehiscing; connective generally produced in an acumen; staminodes none. *Ovary* villous, 4–12- (usually 6–8-) -celled; style linear, subulate, more or less elongate. *Fruit* a globose or oblong or ovoid berry, few-seeded. *Seeds* ellipsoid, usually compressed; testa crustaceous, shining; hilum oblong or linear, conspicuous; albumen none; cotyledons thick, fleshy; radicle small.—DISTRIB. About 40 species, found in India, Ceylon, the Malay Peninsula, and Malay Archipelago.

In several of the species the fruit is unknown, and some of these may prove, when it becomes available, to belong to *Payena*, which is hardly separable except by the important character of having albuminous seeds and leafy cotyledons.

We have not followed Baillon and Engler in changing the name of this genus to *Illipe*, as we agree in the opinions expressed by Drs. Trimen ("Flora of Ceylon") and Cooke ("Flora of Bombay") that the word *Illipe* was not intended by König to be employed as the name of a genus, but was merely mentioned as being the vernacular name employed by the natives of Malabar for one of the species.

Flower-buds large, nearly ·75 in. long, conical; intramarginal nerve of leaves prominent; pedicels thick, 1·5 to 2 in. long ..	1. *B. aristulata.*
Flower-buds moderately large, about ·4 in. long, globose; intramarginal nerve present; pedicels short, about ·4 in. long :—	
Intramarginal nerve conspicuous; leaves 10 to 14 in. long ..	2. *B. Kingiana.*
Intramarginal nerve faint; leaves 4 to 6 in. long ..	3. *B. Kunstleri.*
Flower-buds moderately large, ·4 in. long or rather less, conical :—	
Leaves large, over 6 in. long; main-nerves prominent :—	
Pedicels over 1 in. long; leaves coriaceous, silky-pubescent beneath; main-nerves straight, intramarginal nerve present; connective of anthers penicillate	4. *B. penicillata.*
Pedicels under ·6 in. long; leaves chartaceous, sparsely pubescent beneath; main-nerves curved, no intramarginal nerve; connective of anthers not penicillate	5. *B. malaccensis.*
Leaves moderate-sized, under 6 in. long; main-nerves not prominent	6. *B. Curtisii.*
Flower-buds small, under ·3 in. long, usually conical, generally in many-flowered fascicles :—	
Pedicels usually under ·5 in. long :—	
Pedicels and flower-buds densely tawny-pubescent; connective of anthers produced in a long point	7. *B. laurifolia.*

Pedicels and flower-buds thinly rusty-pubescent; connective of anthers produced in a short ciliate point .. .. 8. *B. rupicola.*
Pedicels ·5 in. long or longer :—
Flowers fascicled in the axils of upper leaves generally, rarely on old wood below them :—
Leaves glabrous, coriaceous, main-nerves indistinct .. 9. *B. perakensis.*
Leaves grey-silky-pubescent beneath, almost coriaceous, main-nerves distinct but not prominent .. .. 10. *B. argentea.*
Leaves only slightly pubescent beneath, chartaceous, main-nerves very prominent .. .. .. 11. *B. Braceana.*
Flowers fascicled chiefly in the axils of the scars of fallen leaves, on old wood :—
Leaves chartaceous, elliptic; main-nerves prominent .. 12. *B. longistyla.*
Leaves coriaceous, oblong; main-nerves not prominent :—
Main-nerves of leaves (under 6 in. long) curved upwards, but no intramarginal nerve; anther-connective long-apiculate .. .. 13. *B. cuprea.*
Main-nerves of leaves (over 6 in. long) meeting in an intramarginal nerve; anther-connective shortly apiculate .. .. 14. *B. Motleyana.*

SPECIES OF WHICH FLOWERS ARE IMPERFECTLY KNOWN.

Leaves under 5 in. long, obovate, obtuse, greenish-brown when dry .. .. 15. *B. cuneata.*
Leaves 5 to 7 in. long, oblong-lanceolate, greyish-green when dry .. .. 16. *B. penangiana.*
Leaves 6 to 8 in. long, obovate-oblong, orange-red when dry .. 17. *B. erythrophylla.*

1. BASSIA ARISTULATA, King & Gamble, n. sp. A tree; branchlets stout, brown, lenticellate. *Leaves* coriaceous; oblong, shortly and rather suddenly acute at apex, somewhat rounded unequally and then decurrent at base; glabrous on both surfaces except on the midrib beneath; margins slightly recurved; 6 to 10 in. long, 3 to 4 in. broad; midrib thick, prominent, impressed above; main-nerves 24 to 28 pairs, conspicuous, parallel, ·3 to ·4 in. apart, starting at about 75° with the midrib, scarcely curved, meeting in a conspicuous intramarginal looped nerve; reticulations oblique, not prominent; petiole 1·5 to 2 in. long, grooved above, much thickened below. *Flowers* fascicled, about 2 to 6 together, in the axils of the leaves or of the scars of fallen leaves, on very short tubercles; pedicels thick, 1·5 to 2 in. long, densely golden-pubescent, flattened under the flower; buds elongate, conical, nearly ·75 in. long. *Calyx-lobes* 4, ·5 to ·7 in. long; the 2 outer valvate, triangular-ovate, pubescent; the 2 inner imbricate, concave, ovate, pubescent. *Corolla-tube* short, ·2 to ·3 in. long, funnel-shaped, densely pubescent inside; lobes 8 to 9, oblong-lanceolate, ·4 in. long, pubescent without. *Stamens* many, up to 36, in 2 or 3 rows, lowest row about 8 to 9, second row 16 to 18, third row 8 to 9, inserted on the top of the corolla-tube; filaments very short, pubescent; anthers

oblong, thin, ·2 in. long, opening along their edge; connective black, prominent, ending in a long sharp awn, the anthers usually twisted half round. *Ovary* silky-pubescent, flat at top, style glabrous about equal to corolla, cells 10 to 12. *Fruit* not known.

PERAK: at Goping, *Scortechini* 1984.

Said by Scortechini to give a guttapercha.

2. BASSIA KINGIANA, Brace MS. in Herb. Calc. A tree, reaching 50 to 60 feet in height, and 10 to 15 in. in diam.; branchlets thick. *Leaves* coriaceous, dark green; obovate-oblong, rounded and then shortly and abruptly acuminate at apex, cuneate at base; glabrous on both surfaces, margins slightly reflexed; 10 to 14 in. long, 3·5 to 4·5 in. broad; midrib very strong, prominent; main-nerves about 20 pairs, conspicuous, ·5 to ·7 in. apart, starting nearly at right angles to the midrib and curving upwards to meet in a conspicuous intramarginal looped nerve; secondary nerves few but prominent; reticulations distant, not numerous; petiole 2 in. long, grooved above, swollen at base, and then conspicuously rugose when dry; stipules subulate-acuminate from a broad base, very quickly caducous. *Flowers* fascicled, about 3 to 5 together, on small tubercles above the scars of fallen leaves on the previous year's wood; pedicels recurved, thick, ·4 in. long, enlarged above, covered as also the calyx with appressed tawny pubescence; buds globose, about ·4 in. long. *Calyx-lobes* 4, ·4 in. in diam.; outer 2 imbricate, rounded emarginate, thick; inner 2 also imbricate, concave, ciliate on the margins. *Corolla-tube* funnel-shaped, ·15 in. long, rusty-hirsute without, pubescent within; lobes 12 to 16, white, much imbricate or in 2 rows, spathulate, ciliate on the margins, hirsute, ·25 in. long. *Stamens* many, 32 to 36, in 2 rows on the top of the corolla-tube; filaments ·1 in. long, rather stout, densely hirsute; anthers linear-oblong, ·125 in. long; connective produced into a broad appendage, penicillate at tip, in bud merely aristate. *Ovary* rounded, villous; style thick, curved, pubescent, ·3 in. long, with minute stigmatic lobes; cells about 8. *Fruit* a globose, thickly tawny-pubescent, berry, ·75 in. in diam., surmounted by the long subulate persistent style, seeds 1 to 2. *Seed* not seen.

PERAK: *King's Collector* 3314, 3678, 7389; in open jungle at 300 to 500 feet. SINGAPORE: *Ridley* 6238, 6294.

3. BASSIA KUNSTLERI, Brace MS. in Herb. Calc. A tree with spreading branches, reaching a height of 30 to 40 feet and 10 to 15 in. in diam.; branchlets slender, grey, innovations rusty-pubescent. *Leaves* chartaceous; obovate-oblong or oblong, abruptly acuminate at apex, acuminate at base, glabrous on both surfaces; 4 to 6 in. long,

1·5 to 2 in. broad; midrib slender, prominent; main-nerves 15 to 20 pairs, starting at an angle of about 60° to the midrib and curving upwards to meet in a faint intramarginal looped nerve; secondary nerves and reticulations prominent; petiole slender, 1 to 1·5 in. long, bordered above in its upper part by the decurrent margins of the blade, base enlarged, sometimes twisted. *Flowers* solitary or fascicled 2 to 3 together in the axils of the leaves, or above the scars of fallen leaves; pedicels thick, ·3 to ·4 in. long, usually recurved, densely rusty- or golden-pubescent like the calyx-lobes and fruit; buds ovoid-orbicular about ·4 in. long. *Calyx-lobes* 4, ·4 in. long; outer valvate, ovate-orbicular; inner imbricate, concave, somewhat emarginate, thin and ciliate on the edges. *Corolla* tubular-campanulate; tube about ·125 in. long, glabrous on both sides; lobes 16, in 2 rows, very much imbricate, shortly spathulate, rounded at top, fimbriate on the margins, shortly pubescent within, 3-nerved. *Stamens* about 32, in 2 rows, mixed with long unicellular brown hairs; filaments thick, about 0·5 in. long; anthers oblong, opening by marginal slits, often twisted half round; connective conspicuous, produced in a sharp mucro. *Ovary* rounded, villous; style subulate, ·5 to ·7 in. long; cells about 8. *Fruit* an ovoid densely pubescent brown berry, ·8 to 1 in. long, 1–2-seeded, surmounted by the persistent style. *Seed* ovoid, obliquely pointed below, rounded above, ·7 in. long, ·4 in. in diam., sometimes flattened on one side; testa thin, crustaceous, chestnut-brown, shining; hilum very large, obovate; albumen none; cotyledons thick, ·5 in. long, ovate; radicle small, pointed.

PERAK: on Larút peak, at 500 to 2,600 feet, *King's Collector*, 3241, 3547, 3964, 6410; *Wray* 2643, 3201; *Curtis* 3694; *Ridley* 5536.

4. BASSIA PENICILLATA, King & Gamble, n. sp. A large tree, reaching 60 feet in height with a girth of 4 feet; ultimate branchlets and innovations densely ferruginous-pubescent. *Leaves* coriaceous; oblong or somewhat obovate-oblong, shortly and abruptly acute at apex, unequally rounded at base; glabrous above, thickly golden-silky-pubescent beneath when young, afterwards glabrate; margins recurved; 6 to 10 in. long, 2·5 to 3·5 in. broad; midrib thick, prominent, impressed and keeled above; main-nerves 24 to 28 pairs, conspicuous, parallel, ·3 to ·5 in. apart in large leaves, starting at about 80° with the midrib, curved only near the margin to meet in an inconspicuous looped intramarginal nerve; secondary nerves many in large leaves; reticulations oblique, not prominent; petiole 1·2 to 1·5 in. long, thickened below. *Flowers* fascicled, about 1 to 4 together in the axils of the leaves, on very short rusty-pubescent tubercles; pedicels 1 to 1·2 in. long, slender, pubescent; buds conical. *Calyx-lobes* 4, sometimes 5, ·4 in. long; outer pair ovate-acuminate, densely rusty-pubescent, thick; inner pair,

sometimes 3, ovate acuminate, thinner, pubescent on the back, ciliate and more or less scarious on the margins. *Corolla* campanulate, ·4 in. long; tube nearly ·2 in. long, glabrous outside, densely ferruginous hairy within in the upper half; lobes 10 (?), lanceolate, acuminate, as long as tube. *Stamens* 20 in 1 row, but the 10 opposite the corolla-lobes behind the 10 alternate with them; filaments ·05 in. long, hairy; anthers linear-sagittate, extrorse, the connective produced in a long penicillate acumen. *Ovary* rounded, densely hairy, as is the lower half of the ·75 in. long slender style; cells 10. *Fruit* not known.

PROVINCE WELLESLEY: at Tassek Glugor, *Curtis* 3737, said to be common. Vern. name "*Minjato.*"

In its leaves this species greatly resembles *B. aristulata*, but the slender pedicels, smaller flowers, acuminate calyx, and penicillate anthers at once distinguish it.

5. BASSIA MALACCENSIS, King & Gamble. A large tree (?); branchlets dark brown, rough, with prominent old leaf-scars, innovations nearly glabrous. *Leaves* chartaceous or almost membranous; obovate or obovate-oblong, obtuse or shortly and abruptly acute at apex, cuneate at base; glabrous above, sparsely and minutely pubescent beneath when young, glabrous when old; 6 to 12 in. long, 4 to 6·5 in. broad; midrib prominent, thick; main-nerves very conspicuous, 14 to 16 pairs, parallel, in average leaves ·5 in. apart, in large ones often nearly 1 in., starting at an angle of 60° with the midrib, at once curving gently upwards to and along the margin; secondary nerves few, reticulations mostly transverse, not prominent; petiole 1 to 2 in. long, slightly bordered above to about half-way down by the decurrent margins of the blade, base much swollen, wrinkled. *Flowers* fascicled 4 to 8 together in the axils of the leaves or of the scars of fallen leaves, on rather thick pubescent tubercles; pedicels ·4 to ·6 in. long, pubescent; buds when young rounded-conical. *Calyx-lobes* 4; 2 outer valvate or slightly imbricate, ovate, bluntly acute or mucronate, rusty-pubescent, ·25 in. long; 2 inner imbricate, ovate-acute, margins sometimes scarious, sometimes ciliate, back thickly rusty-pubescent, more or less keeled. *Corolla* campanulate; tube very short, rarely ·1 in. long, with a short ring of hairs at the mouth inside; lobes 10–12, lanceolate, obtuse, sub-2-seriate, ·25 to ·3 in. long, glabrous except for a few stiff hairs outside. *Stamens* 20 to 24 in 2 rows; the inner almost or quite sessile, alternate with the corolla-lobes; the outer with short densely pubescent filaments, longer than the inner ones; anthers narrowly lanceolate with long hairs, opening on the margins; connective produced in a long hair-like acumen. *Ovary* hairy, elongate, conical, style ·25 in. long. *Fruit* a fleshy obovate-oblong berry with somewhat flattened top, surmounted

by the persistent base of the style and supported by the persistent calyx-lobes, nearly 1 in. long. *Seed* 1, oblong, acute at the top, ·7 in. long, ·35 in. broad, and about ·3 in. thick; testa shining, crustaceous, chestnut-brown; hilum ·15 to ·2 in. broad; albumen none; cotyledons thick, inner face somewhat striate; radicle rather large, inferior. *Payena malaccensis*, Clarke in Hook. f. Fl. Br. Ind. III. 547. *Keratephorus Wightii*, Maingay MS. (*not of* Hassk.).

MALACCA: *Griffith* (K.D.) 3610; *Maingay* (K.D.) 992. PERAK: *Wray* 1229; *Scortechini* 314. SINGAPORE: *Ridley* 2082, 2757, 5643, 6042, 6132, 6133, 6498, 6499, 6500, 6531, 8078, 10159.

Wray says this species gives only a sticky gutta in small quantities.

6. BASSIA CURTISII, King & Gamble, n. sp. A tree, reaching 40 to 50 feet in height; branches greyish-brown, strongly marked by the scars of fallen leaves and the prominent tubercles of fallen flowers, innovations very slightly rusty-pubescent, thick. *Leaves* very coriaceous; clustered at the ends of the branchlets, obovate or sometimes lanceolate-obovate, obtuse emarginate or very suddenly and shortly blunt-acuminate; glabrous on both surfaces, margins strongly recurved; 4 to 6 in. long, 1·25 to 2·5 in. broad; midrib stout, prominent; main-nerves not prominent, 14 to 15 pairs, at an angle of about 70° with the midrib, ·3 to ·4 in. apart, straight, joined near the margin by a looped intramarginal nerve; secondary nerves prominent, reticulations few; all raised on the under surface; petiole ·7 to 1 in. long, rather thick, bordered by the decurrent margins of the blade, base swollen. *Flowers* fascicled, many (10 to 12) together on prominent tubercles in the axils of the scars of fallen leaves below the leaf-cluster, and covering the branchlets densely for a distance of about 4 in.; pedicels ·25 (buds) to ·5 (flower) in. long, somewhat angular, decurved, densely pale tawny-pubescent; buds ovoid-conical. *Calyx-lobes* rounded, obtuse, densely tawny-pubescent, ·2 in. long, the outer pair thick, the inner somewhat keeled, scarious on the margins. *Corolla* campanulate, rather longer than the calyx; tube short, glabrous except for the ring of hairs at the insertion of the stamens; lobes 8, oblong spathulate, ciliate and hirsute at the tip. *Stamens* 16; filaments short, slender, villous; anthers ovate-acute, the connective ending in a sharp conical acumen, extrorse. *Ovary* rounded, villous; style thick glabrous, stigmas minute; cells 8. *Fruit* an oblong berry, covered without with appressed golden pubescence, ·5 to ·7 in. long, ·5 in. broad, crowned with the persistent style and supported by the persistent calyx; seeds 1–2, placentas thin. *Seeds* oblong, pointed at the ends; testa crustaceous, shining; hilum narrow; albumen none; cotyledons thick, fleshy; radicle small.

PENANG: *Curtis* 1451, 3536. PERAK: *Wray* 512, Vern. "Gutta Gannu"; *Scortechini* 1408.

This species comes near both to *B. Motleyana*, from which it differs in having more coriaceous leaves, larger flowers, and a pubescent fruit; and to *B. cuneata*, in which the leaves (judging from the poor specimens in Kew Herbarium) are thinner and the fruit larger and nearly glabrous, with more rounded seeds and a broad hilum.

7. **BASSIA LAURIFOLIA**, King & Gamble, n. sp. A tree reaching 60 feet in height and a diam. of 12 to 18 in.; branches spreading; branchlets pale brown, rather thick, innovations densely pubescent with yellowish-tawny hairs. *Leaves* chartaceous; obovate-lanceolate, gradually acuminate at apex, also at base; glabrous on both surfaces except on the sides of the midrib beneath; 5 to 10 in. long, 1·5 to 3·5 in. broad; midrib prominent, impressed and keeled above; main-nerves prominent, regular, 14 or 15 pairs, about ·3 in. apart, starting at about 45° with the midrib, gradually curving upwards; reticulations obliquely transverse, faintly marked; petiole ·75 to 1 in. long, slender, glabrous above, tawny-pubescent at base, bordered by the decurrent margins of the blade and marked above by the produced keel of the midrib; stipules linear-subulate, tawny-pubescent, nearly ·5 in. long, very caducous. *Flowers* fascicled, about 6 together, on hairy tubercles in the axils of the leaves or of the scars of fallen leaves near the top of the branchlets; pedicels ·4 to ·5 in. long, usually recurved, densely tawny-pubescent, thicker in fruit; buds small, conical. *Calyx-lobes* 4, about ·2 in. long, rather narrowly ovate; the outer pair obtuse; the inner acute, all densely tawny-pubescent without, glabrous within. *Corolla* campanulate; tube ·05 in. long with a ring of hairs at the mouth inside; lobes 8, oblong-spathulate, ·1 in. long, glabrous. *Stamens* 14 to 16, ·1 in. long; filaments short, thickly hairy; anthers linear-sagittate, the connective produced in a long sharp acumen. *Ovary* rounded, glabrous; style slender, ·3 in. long; cells apparently 8. *Fruit* a black glabrous oblong berry about ·6 to ·7 in. long and ·4 in. broad. *Seed* 1, ovoid, ·5 to ·6 in. long, slightly compressed; testa thin, crustaceous, shining, dark brown; hilum broad; albumen none; cotyledons oblong, fleshy, about ·3 in. long and nearly ·2 in. broad; radicle inferior, rather large.

PERAK: on low ground, *King's Collector* 3104, 3718, 3720.

VAR. *obtusa*, King & Gamble. *Leaves* obtuse with an abrupt acumen. *Calyx-lobes* obtuse, thickened at tip. *Corolla-lobes* ciliate at the apex, glandular-striate; anthers and produced connective very hirsute.

PENANG: *Curtis* 159, 2254, 3589—a small tree, fairly common.

VAR. *parvifolia*, King & Gamble. *Leaves* smaller than in type;

innovations not tawny-pubescent. *Calyx-lobes* more rounded and glabrous; pedicels longer.

KEDAH: on Kedah Peak, *Ridley* 5506.

Ridley's No. 2673 from Tahan Woods, Pahang, is very near *B. laurifolia*, but the pedicels are much longer and the calyx-lobes not tawny-pubescent. The material is insufficient for description.

8. BASSIA RUPICOLA, King & Gamble, n. sp. A tree reaching 40 to 60 feet in height and 15 to 20 in. in diam.; branchlets dark grey, marked by the prominent scars of fallen leaves, innovations puberulous; leaf-bud scales ovate-lanceolate, ·25 in. long. *Leaves* coriaceous; obovate-oblong, bluntly acute at apex, cuneately attenuate at base; dull and glabrous on both surfaces; 3·5 to 5·5 in. long, 1·5 to 2 in. broad; midrib thick, conspicuous; main-nerves 8 to 10 pairs, starting at an angle of 45° with the midrib, then curving upwards, sometimes rather indistinct, about ·4 in. apart; reticulations many, obscure, obliquely transverse; petiole ·5 to 1 in. long, grooved above and bordered by the decurrent base of the blade, swollen below. *Flowers* fascicled, about 5 together, in the axils of the leaves, on small tubercles; pedicels ·15 in. long, ferruginous-pubescent like the calyx and buds. *Calyx-lobes* 4, 2 outer valvate; 2 inner valvate or imbricate, ovate, ·2 to ·25 in. long; all more or less recurved and ciliate at tip. *Corolla* tubular-campanulate, lobes and tube nearly equal, mouth of tube inside with a ring of soft ferruginous hairs; lobes oblong, ciliate at tip, sparsely hairy without, nerves spreading. *Stamens* 16, inserted above the ring of hairs in the mouth of the tube; filaments slender, ·05 in. long, pubescent; anthers ovate-mucronate, tip ciliate, extrorse. *Ovary* ovoid; style curved, ·3 in. long, stigma flat, minute. *Fruit* not seen.

PERAK: in rocky creeks on Gunong Batu at 1,500 to 2,000 feet, *King's Collector* 7411.

9. BASSIA PERAKENSIS, King & Gamble, n. sp. A tree reaching 60 to 80 feet in height and a considerable girth; branchlets thick, dark grey, prominently marked by the scars of fallen leaves and the tubercles on which the flower fascicles grew. *Leaves* coriaceous; oblong or obovate-oblong, shortly and abruptly acuminate at apex, acuminately narrowed at base; margins recurved, glabrous on both surfaces; 4 to 6 in. long, 1·5 to 2·5 in. broad; midrib stout, prominent; main-nerves slender, indistinct, 14 to 18 pairs, starting at an angle of 50° with the midrib, parallel, straight at first, arching near the margin to join in an intra-marginal looped nerve which is also met by the secondary nerves between the main ones; reticulations faintly marked on both surfaces; petiole ·75 to 1 in. long, rather thick, bordered above by the decurrent

margins of the blade, swollen below. *Flowers* in fascicles of up to 10 to 12, on tubercles in the axils of the leaves or above the scars of fallen leaves on the previous year's wood; pedicels ·5 to ·6 in. long, slender, flattened below the flowers, densely pubescent at first, afterwards nearly glabrous, recurved in fruit; buds small, conical. *Calyx-lobes* 4, ·2 in. long; 2 upper ovate-acute, densely pubescent, valvate; 2 lower imbricate, also densely pubescent, ciliate on the margins, somewhat keeled, ovate-acute. *Corolla* funnel-shaped; lobes 8, throat villous. *Stamens* about 16; filaments short glabrous; anthers sagittate. *Ovary* globose, villous, 8-celled, style ·3 to ·4 in. long, stigma minutely lobed. *Fruit* an ovoid densely pubescent berry about ·7 to ·9 in. in diam., crowned by the persistent style; seeds 1–2. *Seed* ovoid-oblong, ·65 in. by ·35 in., acute at base; testa shining, chestnut-brown, thin, crustaceous; hilum large, oblong; albumen none; cotyledons oblong, ·45 in. long, ·25 in. broad, radicle very small.

PERAK: *King's Collector* 512, 3846; *Curtis* 3695, on the Larút hill up to 2,500 feet.

10. BASSIA ARGENTEA, Clarke in Hook. f. Fl. Br. Ind. III. 545 (1882) (*not of* de Vriese). A large tree; branchlets rather thick, greyish-brown. *Leaves* coriaceo-chartaceous; elliptic or elliptic-oblong, abruptly acuminate at apex, acute and often unequal at base; glabrous above, shining grey-silky beneath when young, nearly glabrous when old; 4 to 7 in. long, 2·5 to 3 in. broad; midrib prominent, thick; main-nerves 13 to 15 pairs, about ·4 in. apart, starting at about 60° with the midrib, at first straight then curving upwards; reticulations many, very oblique; petiole 1 in. long, upper part bordered by the decurrent margin of the blade, swollen below and rugose. *Flowers* fascicled in clusters of 6 to 10 in the axils of the leaves, or above the scars of fallen leaves; pedicels slender, about ·5 in. long, appressed-pubescent; buds conical. *Calyx-lobes* 4, outer and inner pairs both valvate; lobes ovate, ·2 to ·25 in. long, acute, pubescent. *Corolla* tubular-campanulate, tube ·1 in. long; lobes 8 to 9, ·15 in. long, linear-oblong. *Stamens* usually 24, in 3 rows, inserted on the top of the tube on a ring of rusty hairs; filaments very small or none; anthers ovate, densely hirsute, black-apiculate. *Ovary* rounded, depressed above, villous; style ·2 to ·3 in. long, villous half-way up, subulate; stigma capitate; cells 8 to 10. *Fruit* not seen.

MALACCA: *Maingay* (K.D.) 991, 1524; *Derry* 941.

Bassia argentea, de Vriese, seems to be a *Sideroxylon*, *cf.* Burck & Koord. & Val.

11. BASSIA BRACEANA, King & Gamble, n. sp. A tree with spreading branches, reaching 50 to 70 feet in height and 10 to 20 in. in diam.; branchlets pale brown. *Leaves* chartaceous; bright green, glossy,

oblong or elliptic-oblong, acuminate both at apex and at base; glabrous above, minutely pubescent on the nerves or in the axils of the nerves beneath; 4 to 8 in. long, 2 to 3 in. broad; midrib thick, impressed above; main-nerves 14 to 18 pairs, regular, parallel, conspicuous, about ·4 in. apart, starting at about 60° with the midrib, arching upwards to join near the margin; reticulations oblique, slender but conspicuous, joining the main-nerves more or less horizontally; petiole ·8 to 1·4 in. long, grooved above and bordered by the decurrent margins of the blade, thickened and somewhat curved below. *Flowers* fasciculate, usually 4 to 7 together, in the axils of the leaves, or above the scars of fallen leaves on the last year's wood below; pedicels ·4 to ·6 in. long, thickened above, otherwise slender, slightly pubescent. *Calyx-lobes* 4, ·15 to ·25 in. long; 2 outer opposite ovate rounded, enclosing the 2 inner concave rounded; sometimes ciliate on the margins, sometimes slightly emarginate, all more or less golden-pubescent without; enlarged after flowering. *Corolla* cream-coloured; tube cylindrical, short, about ·1 in. long only; lobes more or less spreading, 8 to 9, linear-oblong, ·2 in. long, slightly twisted. *Stamens* 16 to 18, in 2 rows, inserted on the top of the tube inside above a thick ring of tawny hairs; filaments very short; anthers ovate-lanceolate, strigosely hirsute, the connective ending in a long dark acumen. *Ovary* globose, glabrous; style ·15 in. long, stigmas very minute; cells about 8. *Fruit* an oblong green fleshy berry, ·8 to 1 in. long, crowned by the remains of the style; seed usually 1 only. *Seed* ovoid, flattened, ·8 in. long, ·5 in. broad, and ·25 in. thick; testa chestnut-brown, shining, crustaceous; hilum elongate, pale, conspicuous; albumen none; cotyledons thick, ·5 to ·6 in. long, ovoid, somewhat acute; radicle minute.

PENANG: *Curtis* 3063. PERAK: *King's Collector* 1846, 3195, 3275, 3740, 6447, 7584, 10412; *Scortechini* 314, 1483; *Wray* 1775, 2613, 2694.

VAR. *lanceolata*, King & Gamble. *Leaves* narrower, more lanceolate-acuminate; main-nerves closer. *Flowers* more numerous in the fascicles and fascicles more numerous on the last year's wood. *Corolla-lobes* often unequal in length, acute. *Anthers* with the acumen bifid.

PERAK: *Wray* 189, 1248, up to 3,400 feet.

13. BASSIA LONGISTYLA, King & Gamble, n. sp. A large tree, reaching 80 to 100 feet in height; branchlets thick, dark greyish-brown, innovations minutely pubescent. *Leaves* chartaceous; elliptic, shortly and rather abruptly acuminate at both apex and base; glabrous on both surfaces; 3·5 to 5 in. long, 1·5 to 2 in. broad; midrib slender; main-nerves 12 to 14 pairs, leaving the midrib almost at right

angles and curving upwards to meet near the margin; secondary nerves somewhat prominent as are the reticulations; petiole ·6 to ·8 in. long, slender, grooved above. *Flowers* fascicled, often up to 10 together, on tubercles above the scars of fallen leaves on the last year's wood; pedicels slender, glabrous, ·5 to ·7 in. long. *Calyx-lobes* 4, ·15 to ·2 in. long, ovate, somewhat acute, somewhat pubescent outside, the 2 outer enclosing the 2 inner. *Corolla* with very short (·05 in. long) cylindrical tube; lobes 8 to 9, rather spreading, oblong-lanceolate, obtuse or emarginate, prominently nerved, glabrous. *Stamens* 16 to 18, ·2 in. long, inserted in 2 rows on the top of the tube above a short ring of tawny hairs; filaments ·125 in. long, slender; anthers ovate, ·075 in. long, apiculate, extrorse. *Ovary* cylindrical, style ·5 in. long, surmounted by a minute rounded stigma. *Fruit* unknown.

PERAK: *King's Collector* 2680. SINGAPORE: *Ridley* 6498 (?).

This species comes very near to *B. Braceana*, but the anthers differ so much that we hesitate to join them.

13. BASSIA CUPREA, King & Gamble, n. sp. A tree reaching 60 to 70 feet in height; branchlets thick, brown, uppermost somewhat angular. *Leaves* coriaceous; oblong, obtuse or emarginate at apex, attenuate at base and somewhat unequal; glabrous above, sparsely hairy on the nerves beneath, otherwise glabrous; 4·5 to 6 in. long, 2·5 to 3 in. broad; of a coppery-brown colour when dry; midrib very thick and prominent; main-nerves 10 to 12 pairs, starting at an angle of about 50° with the midrib, curving upwards to and along the margin; reticulations visible but not strong; petiole thick, ·75 to 1 in. long, bordered above by the decurrent margin of the blade. *Flowers* fasciculate in the axils of the leaves or of the scars of fallen leaves, 2 to 5 or more in a fascicle, fragrant; pedicels ·5 in. long, pubescent; buds conical, ·3 in. long. *Calyx-lobes* 4, ·25 in. long; 2 outer valvate, broadly ovate, shortly pubescent; 2 inner rounded concave, shallowly emarginate, ciliate and scarious on the margins, pubescent without. *Corolla* ·4 in. long; tube funnel-shaped, ·1 in. long, mouth densely brown-hirsute; lobes 8–9, erect or spreading, ·3 in. long, oblong, rounded at apex, long brown-silky-pubescent on back, strigosely hairy within. *Stamens* 18 to 22, inserted on the mouth of the tube; filaments hairy, ·05 in. long; anthers ovate-acuminate, ·15 in. long, the connective produced in a long usually curved acumen, strigosely hirsute. *Ovary* oblong, glabrous, 8–10-celled, ending in a style ·5 in. long surmounted by a minutely 9–10-lobed flat stigma. *Fruit* not seen.

PERAK: *Scortechini* 1879.

This species comes near to *B. Motleyana*, Clarke, but the flowers are much larger and different.

14. BASSIA MOTLEYANA, Clarke in Hook. f. Fl. Br. Ind. III. 546 (1882). An erect lofty tree of swampy places; branchlets dark brown, marked by prominent leaf-scars. *Leaves* coriaceous, elliptic, shortly and abruptly acuminate at apex, cuneate at base, the two sides sometimes unequal; glabrous on both surfaces; 4 to 5 in. long, 1·5 to 2·5 in. broad; midrib prominent, raised above; main-nerves 10 to 12 pairs, irregularly spaced, generally at about an angle of 60° with the midrib, meeting near the margin in a looped intramarginal nerve; secondary nerves prominent, similar to the main-nerves, reticulations few; petiole ·8 to 1·2 in. long, rather thick, bordered by the decurrent margins of the blade. *Flowers* fascicled, many together (10 to 12), in the axils of the leaves or of the scars of fallen leaves below the terminal tuft, often fully clothing the branchlets for a distance of 6 in. or more; pedicels slender, ·4 to ·7 in. long, buds ovoid. *Calyx-lobes* 4, ·15 to ·2 in. long, ovate, obtuse or somewhat acute, sparsely pubescent, the inner pair somewhat scarious on the margins. *Corolla* campanulate, ·15 to ·2 in. long; tube short, about ⅓ of the whole; lobes 8, 4 outer enclosing 4 inner, oblong-spathulate, obtuse at tip and ciliately ferruginous-pubescent. *Stamens* 16, inserted on the top of the tube on a ring of long ferruginous hairs; filaments short, slender; anthers ovate-lanceolate, short-apiculate. *Ovary* rounded, villous, 6–8-celled; style ·5 in. long, thick, sparsely pubescent. *Fruit* an obovoid glabrous berry, acute at top and furnished with the remains of the persistent style; calyx-lobes also persistent; ·5 in. long, ·3 in. broad, 1–2-seeded. *Seeds* oblong, acute at both ends; testa crustaceous, shining; albumen none; cotyledons fleshy; radicle small. Burck in Ann. Jard. Buit. V. 44. *Isonandra Motleyana*, de Vriese in Miq. Journ. Bot. Neerl. I. (1861) 257.

MALACCA: *Griffith* (K.D.) 3608; *Derry* 1026. JOHORE: *Ridley* 6496. SINGAPORE: *Ridley* 5645, 5896.—DISTRIB. Borneo (*fide* Burck).

De Vriese says the milky juice gives a gutta of bad quality, being more waxy and fragile than that of other kinds.

VAR. *Scortechinii*, King & Gamble. *Leaves* much larger, 6 to 8 in. long, 2·5 to 3·5 in. broad, main-nerves 15 or 16 pairs. *Fruit* nearly globose—a dark green berry, shining when dry.

PERAK: *Scortechini*, at Port Weld, No. 1550; *King's Collector* 5454, 6735, on low, wet ground—a tree reaching 60 to 80 feet in height and 15 to 20 in. in diam.

15. BASSIA CUNEATA, Bl. Bijdr. 675. A tree (?); branchlets dark brown, scarred, rather thick. *Leaves* coriaceous; clustered at the ends of the branchlets, greenish-brown when dry, obovate, obtuse-emarginate or very shortly and abruptly acute at apex, cuneate at base;

glabrous, margins slightly recurved; 4 to 5 in. long, 2 to 3 in. broad; midrib stout, prominent, impressed above; main-nerves not prominent, about 20 pairs, nearly at right angles to the midrib, anastomosing near the margin with the secondary nerves; reticulations transverse; petiole ·6 to 1 in. long, bordered by the decurrent margins of the blade. *Flowers* in axillary fascicles as long as the petiole, not seen. *Fruit* a globose berry ·75 to 1 in. in diam., 1–3-seeded. *Seeds* ·5 to ·7 in. long, ·5 in. broad and thick, ovoid, not compressed, pointed at both ends; testa crustaceous, chestnut-brown, shining; hilum very broad (·4 in.); albumen none; cotyledons fleshy, semi-ellipsoidal. Miq. Fl. Ind. Bat. II. 1041; A. DC. Prod. VIII. 199; Clarke in Hook. f. Fl. Br. Ind. III. 546; Koord. & Val. Bijdr. I. 154.

Malacca: *Maingay* (K.D.) 986. Singapore: *Ridley* 6502.—Distrib. Java.

16. **Bassia penangiana**, King & Gamble, n. sp. A tree (?); branchlets dark grey. *Leaves* chartaceous; oblong-lanceolate, acutely attenuate at both ends; glabrous, greyish-green when dry; 5 to 7 in. long, 1·5 to 2·5 in. broad; midrib broad, conspicuous, impressed above and then keeled; main-nerves 10 to 12 pairs, starting at an angle of about 50° with the midrib and curved upwards to and along the margin; reticulations transverse, raised above; petiole 1 to 1·2 in. long, bordered by the decurrent margins of the blade, swollen at base; stipules very small, ovate, pubescent, caducous. *Flowers* in fascicles of about 5 to 6 in the axils of the leaves; pedicels slender, ·4 to ·5 in. long, appressed rusty-pubescent. *Calyx-lobes* 4, ovate, obtusely acuminate, recurved, ·2 in. long, lower half thick, wrinkled, upper half thinner, somewhat scarious, sparsely appressed golden-pubescent. *Corolla* tubular-campanulate, ·25 in. long; lobes 8 (?), oblong-spathulate, glabrous within, golden-pubescent without; tube rather shorter than lobes. *Stamens* 16 (?), inserted in a ring of hairs on the top of the tube; filaments slender; anthers linear-oblong, hirsute, the connective produced in a rather long, somewhat blunt, penicillate mucro. *Ovary* conical, glabrous; style slender, ·3 in. long; cells 8.

Penang: *Curtis* 1450.

17. **Bassia erythrophylla**, King & Gamble, n. sp. A tree, 40 to 50 feet in height and 1 foot in diam.; branchlets thick, grey, marked with the scars of fallen leaves and the tubercles of fallen flowers. *Leaves* coriaceous: obovate-oblong, shortly and bluntly acuminate at apex, unequally attenuate at base; glabrous, orange-red when dry, margins slightly recurved; 6 to 8 in. long, 1·5 to 2·5 in. broad; midrib thick, prominent below, impressed above; main-nerves 10 to 12 pairs, rather irregular, starting at an angle of 60° from the midrib and

curved upwards to and along the margin; reticulations transverse, prominent, raised beneath; petiole 1·5 to 2 in. long, thickened at base, bordered above by the decurrent margins of the blade, younger ones golden-pubescent; stipules linear-subulate, ·3 to ·4 in. long, quickly caducous. *Flowers* fascicled, about 5 to 6 together, on raised tubercles above the scars of fallen leaves on year-old wood; pedicels in fruit thick, ·5 to ·6 in. long, golden-pubescent. *Calyx-lobes* 4, in fruit ovate-acute or rounded, densely golden-pubescent on both surfaces, thick; rest unknown. *Fruit* a globose, golden-pubescent, berry somewhat depressed at top and bearing the remains of the persistent style, ·5 to ·6 in. in diam. *Seed* not seen.

PENANG: at Highlands, *Curtis* 3652 (Kew) or 5652 (Calc.).

7. PALAQUIUM, Blanco.

Trees, often of great size and containing a milky juice. *Leaves* usually coriaceous, obovate or oblong, petioled, entire, sometimes covered beneath with a dense silky or tawny pubescence. *Flowers* fasciculate, in the axils of the leaves or of the scars of fallen leaves, pedicellate. *Calyx* of 6 lobes, the outer 3 valvate, the inner 3 imbricate. *Corolla* usually campanulate, tube short; lobes 6, imbricate, often contorted in bud. *Stamens* 12 or more (up to 18), opposite to and alternate with the corolla-lobes, those alternate often shorter and sometimes inserted higher up the tube; anthers ovate-lanceolate, dehiscence extrorse, connective produced; staminodes none. *Ovary* villous, 6-celled; style subulate. *Fruit* a fleshy, ovoid or ellipsoid, berry, 1–2-seeded. *Seeds* large, exalbuminous; the testa crustaceous; cotyledons thick, fleshy; radicle pointed, inferior.—DISTRIB. About 50 to 60 species, found in South India, Ceylon, Eastern Bengal, Burma, the Malay Peninsula and Archipelago, the Philippines, and Samoa (1 sp.). DICHOPSIS, Thw. in. Gen. Pl. II. 658.

Pedicels never over ·75 in. long, distributed for some distance down the upper branchlets:—
  Leaves large, 5 to 12 in. long, obovate-obtuse; branchlets stout, nearly ·5 in. thick:—
    Leaves nearly glabrous and glaucescent beneath, main-nerves distant, irregular .. .. .. 1. *P. obovatum.*
    Leaves ferruginous-pubescent or -tomentose beneath, main-nerves fairly close and regular:—
      Leaves appressed-pubescent beneath, midrib glabrous on upper surface .. .. 2. *P. Maingayi.*
      Leaves spreading-tomentose beneath, midrib hairy on upper surface .. .. 3. *P. Clarkeanum.*
  Leaves rarely over 6 in. long, branchlets rarely ·25 in. thick:—
    Leaves always more-or less obovate:—

Leaves golden-silky-pubescent beneath :—
Main-nerves close, over 20 pairs .. .. 4. *P. Gutta.*
Main-nerves about ⅓ in. apart, under 20 pairs .. 5. *P. Oxleyanum.*
Leaves not or only very slightly silky-pubescent beneath :—
Leaves conspicuously red or yellow when dry .. 6. *P. xanthochymum.*
Leaves not conspicuously red or yellow when dry, usually brown or greenish-brown :—
Leaves over 3 in. long .. .. .. 7. *P. bancanum.*
Leaves 2 to 3 in. long .. .. .. 8. *P. Ridleyi.*
Leaves under 2 in. long .. .. .. 9. *P. microphyllum.*
Leaves elliptic, not obovate :—
Produced connective of anthers bifid at point ; leaves glabrous .. .. 10. *P. hexandrum.*
Produced connective of anthers simple at point ; leaves grey-pubescent beneath .. .. .. 11. *P. Herveyi.*
Pedicels 1 in. long or longer, clustered only at the extreme ends of the branchlets ; leaves oblong-lanceolate, 3–6 in. long .. 12. *P. stellatum.*

1. PALAQUIUM OBOVATUM, King & Gamble. A big tree with a foxy odour (Ridley), evergreen; the branches thick, brown, marked by the very prominent scars of fallen leaves ; leaves clustered towards the ends of the branchlets ; innovations rusty-pubescent. *Leaves* coriaceous ; obovate-cuneate or obovate-oblong, obtuse or very shortly acute at apex, cuneate at base ; recurved and somewhat undulate on the margins ; glabrous above, glaucescent beneath ; 5 to 12 in. long, 2 to 4 in. broad ; midrib thick, prominent, impressed above, much raised beneath ; main-nerves about 12 pairs, at an angle of 40° to 45° with the midrib, inconspicuous above, raised and prominent beneath ; reticulations many, oblique, obscure ; petiole thick, ·7 to 1 in. long, bordered above by the decurrent margins of the blade, glabrescent or slightly rusty-pubescent. *Flowers* in clusters in the axils of the leaves or on tubercles above the scars of fallen leaves ; pedicels 3 to 5 together, ·3 to ·5 in. long, rusty-pubescent ; buds at first globose, afterwards elongate by the growth of the corolla. *Calyx-lobes* 6 ; outer 3 triangular-ovate, thick, pubescent outside, ·15 in. long ; inner 3 imbricate, ovate-obtuse, ·1 in. long, margins scarious. *Corolla* campanulate ; tube very short ; lobes 6, imbricate and twisted, ·4 to ·5 in. long, glabrous without, slightly pubescent within. *Stamens* 12, the 6 longer opposite to, the 6 shorter alternate with, the lobes of the corolla, ovate lanceolate, apiculate, thickly rusty-villous ; filaments as long as anthers, slender, glabrous. *Ovary* globose ; style ·5 in. long, subulate, glabrous. *Fruit* a globose berry, ·75 to 1 in. in diam., pulp fleshy, seeds 1 to 2. *Seed* ovoid, scarcely flattened on one side, pointed at base ; testa thin, shining ; albumen none, cotyledons fleshy. *Dichopsis obovata*, Clarke in Hook. f. Fl. Br. Ind. iii. 542. *Isonandra obovata*, Griff. Notul. iv. 293 ; Kurz

For. Fl. II. 120 and Journ. As. Soc. Beng. XLVI. ii. 230. *Bassia? hypoleuca*, Miq. Fl. Ind. Bat. Suppl. 582 (*fide Kurz*).

Penang: *Holmberg* 783. Malacca: *Griffith* (K.D.) 3606; *Maingay* (K.D.) 985, 996; *Curtis* 3480, 3481, 3482; *Hervey* 2754; *Derry* 59, 88; *Ridley* 10079; *Goodenough* 1994. Singapore: *T. Anderson* 122; *Ridley*. —Distrib. Tenasserim, Sumatra.

Curtis says it gives a low class bastard gutta of little value. Vern. "Niato bunga"; "Niato tunbaga" "Niato balam."

2. Palaquium Maingayi, King & Gamble. A tree; stems reaching 60 feet in height and 10 to 15 in. in diam.; branchlets dark brown, rough, about ·4 in. in diam., marked by the large scars of fallen leaves; innovations densely short-rusty-pubescent. *Leaves* chartaceous; obovate, obtuse at apex, cuneate or slightly rounded and more or less auricled at base; margins recurved; glabrous above except on midrib, thickly ferruginous-pubescent beneath; 5 to 13 in. long, 3 to 7 in. broad; midrib stout, impressed above, prominent beneath, main-nerves 12 to 20 pairs, ·5 to ·8 in. apart, starting at an angle of about 55° with the midrib, parallel to near the margin and then curving upwards to join in a marginal nerve; reticulations not prominent, obliquely joining the main-nerves; petiole 1 to 1·5 in. long, thickly rusty-pubescent, channelled above by the decurrent margins of the blade; stipules subulate falcate, ·5 in. long, very caducous. *Flowers* fasciculate, up to 10 together, in the axils of the leaves or of the scars of fallen leaves; pedicels ·5 to ·7 in. long, rusty-pubescent. *Calyx-lobes* 6; outer 3 valvate, ovate, densely pubescent, ·15 in. long; inner 3 imbricate, orbicular, depressed at top, scarious and ciliate on the margins, ·15 in. long. *Corolla* campanulate; tube short (·1 in.); lobes 6, imbricate, overlapping to the right, ovate-oblong, glabrous, ·25 to ·35 in. long. *Stamens* 12, ·25 in. long, opposite to and alternate with corolla-lobes; anthers ovate, apiculate, slightly rusty-hirsute behind; filaments as long as anthers, slender. *Ovary* rounded; style ·2 to ·4 in. long, subulate; cells 6. *Fruit* a shining, green, fleshy berry, about ·5 in. long, supported by the persistent calyx. *Seeds* 2, oblong; testa dark brown, crustaceous; albumen none. *Dichopsis Maingayi*, Clarke in Hook. f. Fl. Br. Ind. III. 543.

Perak: *Wray* 524, 553, 2215, up to 2,000 feet; *King's Collector* 6644. Malacca: *Maingay* (K.D.) 996/2; *Hervey*.

P. Ottolanderi, Koord. & Val. of Java is near this species, but is readily distinguished by its larger flowers and long pointed fruit.

3. Palaquium Clarkeanum, King & Gamble. A large tree, with thick rough bark and spreading branches, reaching 100 to 150 feet in

height and 2 to 4 feet in diam. of stem; branchlets stout, uppermost ·5 in. in diam., prominently pitted with the scars of fallen leaves, densely ferruginous-tomentose. *Leaves* chartaceous; obovate, obtuse at apex, cuneate at base; glabrous above except on the midrib which is strongly pubescent, densely ferruginous-tomentose beneath; margins recurved; 8 to 10 in. long, 4 to 5 in. broad; midrib very thick; main-nerves 18 to 22 pairs, rather irregular, starting at about 70° to 80° with the midrib, straight at first then arching at and along the margin, impressed above; reticulations obliquely transverse, prominent; petiole ·7 to 1 in. long, thick, densely ferruginous-tomentose, enlarged at base. *Flowers* not seen. *Fruit* an oblong, glossy, bright green berry, 2 in. long, 1-seeded. *Seed* oblong, acute at both ends, rounded on the back, flattened at the hilum, 1·2 in. long, ·5 in. broad; testa thin, chartaceous, shining, chestnut-brown; hilum oblong; cotyledons oblong, fleshy. *Dichopsis Clarkeana*, Brace MS. in Herb. Calc.

PERAK: at Waterfall Hill, 600 feet, *Wray* 530; on open hills near Larút at 500 to 1,000 feet, *King's Collector* 3796.

Wray says the gutta it gives is not enough in quantity to be worth extraction. The tree is evidently closely allied to *P. Maingayi*, and might almost be made a variety of that species.

4. PALAQUIUM GUTTA, Burck in Ann. Jard. Buit. V. 24, t. IV. (1885). A large evergreen tree; branchlets rough, prominently marked with the scars of fallen leaves and with longitudinal wrinkles; innovations minutely ferruginous-pubescent. *Leaves* coriaceous; obovate or obovate-oblong, abruptly and usually shortly acuminate at apex rarely rounded, cuneate at base; margins slightly recurved; glabrous above, densely appressed-golden-silky-pubescent beneath especially when young, when old glabrescent; 3 to 5 in. long, 1·5 to 2·5 in. broad; midrib prominent, impressed above; main-nerves 24 to 30 pairs, indistinct, starting at rather more than 60° with the midrib, parallel and arching only close to the margin; secondary nerves and reticulations inconspicuous, the latter very oblique; petiole 1 to 1·5 in. long, slender, grooved above, slightly thickened at base, appressed-golden-pubescent. *Flowers* in fascicles of about 4 to 5, in the axils of the leaves or of the scars of fallen leaves on the previous year's wood; pedicels thick, ·1 to ·2 in. long, somewhat angular, densely golden-pubescent. *Calyx-lobes* 6; 3 outer valvate, triangular-ovate, ·3 in. long; 3 inner imbricate, rather longer and more acute, golden-pubescent without. *Corolla* rotate-campanulate; tube shorter than the calyx; lobes 6, ovate, obtuse, imbricate and twisted at first, afterwards spreading, ·25 in. long, glabrous. *Stamens* 12, opposite to

and alternate with the corolla-lobes, inserted at the top of the tube; filaments equal, slender, ·1 in. long; anthers shorter than the filaments, ovate, extrorse, the connective produced in a broad point. *Ovary* sub-globose, slightly pubescent, 6-celled; ovules oblong, one in each cell; style ·4 to ·5 in. long, filiform; stigma obtuse. *Fruit* a 1–2-seeded berry, ·6 to ·7 in. in diam., ovoid, acute at top; pulp very glutinous, hard. *Seeds* oblong, rounded at the ends; hilum very large, elliptic, occupying about one-half of the surface; testa shining. Pierre in Bull. Soc. Linn. Par. I. 498; Engl. & Prantl Pflanzenfam. IV. i. 135, fig. 71; Baill. Hist. des Pl. XI. fig. 296. *Dichopsis Gutta*, Benth. in Gen. Pl. II. 658; Clarke in Hook. f. Fl. Br. Ind. III. 543. *Isonandra Gutta*, Hook. Lond. Journ. Bot. VI. 463 t. 16; Walp. Ann. i. 496; Miq. Fl. Ind. Bat. II. 1038 t. XXXVI.; Bentl. & Trim. Med. Pl. t. 167.

PENANG: *Curtis* 780, 3535, 3582, 3633, 3635. PERAK: *Wray* 522. MALACCA: *Maingay* (K.D.) 983. DINDINGS: *Hallifax* (*Curtis* 3639). SINGAPORE: *Lobb* 290; *Ridley* 9519, 11320.

The true guttapercha tree, perhaps the most valuable of all the trees of the Peninsula. It gives the "Taban" Gutta or "Taban Merah." It has become very scarce in a wild state, but is now being much planted, so perhaps it may soon again become common (see also H. C. Hill, Reports on Forest Conservancy in the Straits Settlements and the Federated Malay States, and Burn-Murdoch in "Indian Forester," XXXI. 309, "Some Facts about Gutta Percha.") Ridley, in Trans. Linn. Soc. III. (1893), 317, says the tree was seen by him in several places in the Tahan woods, and that a considerable amount of guttapercha is collected there.

VAR. *oblongifolia*. A large tree; stem reaching 80 feet in height and up to 2 feet in diam. *Leaves* larger than in the typical form, obovate-oblong or lanceolate-oblong; longer, abruptly acuminate, reaching 7 in. in length and 3 in. in breadth, rather more conspicuously golden-pubescent. *Flowers* similar but a little larger, pedicels a little shorter. *Fruit* rather larger, less acute at top. *P. oblongifolium*, Burck in Ann. Jard. Bot. Buit. V. 25 tab. V. *Isonandra Gutta* var. *oblongifolia*, de Vriese, Tuinbouw Flora (1856), III. 226. *Isonandra Gutta*, var. *β. sumatrana*, Miq. Fl. Ind. Bat. II. 1038, and Suppl. 581.

PERAK: *Curtis* 3637, 3725; *Wray* 535; *Murton*; *King's Collector* 6475. JOHORE: *Curtis* 3632—in open forest in the hills at 500 to 1,000 feet.—DISTRIB. Sumatra, Borneo. Gives guttapercha like the type.

We are unable to find sufficient characters for separating this, as a species, from *P. Gutta*, as is done by Burck. The specimens available seem to point to a regular series of intermediates, so that it can scarcely be even maintained as a variety. It is possible that *P. malaccense* and *P. formosum*, Pierre in Bull. Soc. Linn. Par. I. 498, are both forms of *P. Gutta*, but we have seen no specimens. Beccari in "Nelle

Foreste di Borneo," p. 558, suggests the identity of the latter species with *P. oblongifolium*.

5. Palaquium Oxleyanum, Pierre in Bull. Soc. Linn. Par. I. 498 (1885), *non* Burck. A large tree; branchlets dark brown, marked by prominent scars of fallen leaves; innovations minutely ferruginous-pubescent. *Leaves* coriaceous; oblong-obovate, abruptly and shortly acuminate at apex, cuneately attenuate at base; glabrous above, densely appressed-golden-pubescent beneath, finally glabrate, margins recurved; 5 to 8 in. long, 2·5 to 3 in. broad; midrib prominent, thick, impressed above; main-nerves 14 to 18 pairs, irregular, sometimes branched, ·4 to ·5 in. apart, starting at an angle of about 60° with the midrib, curved near the margin to meet in a rather faint looped intramarginal nerve; secondary nerves few; reticulations few, horizontally transverse; petiole 1 to 1·5 in. long, somewhat thickened at base, minutely rusty-pubescent, channelled above and bordered for some distance by the decurrent margins of the blade; stipules minute, falcate, caducous. *Calyx-lobes* 6; 3 outer rather thicker than 3 inner, ovate, sub-acute, densely ferruginous-pubescent, ·25 in. long. *Fruit* a nearly globose berry, 1 in. long and about ·75 in. in diam. *Seeds* oblong; testa shining, crustaceous. *Dichopsis pustulata*, Hemsl. *in Herb. Kew.*

Penang: *Curtis* 3582. Perak: *Curtis* 3631, 3638, 3724—on the hills up to 2,500 feet; *Wray* 511 (*part*), 590; *Douglas*; *Phillips*. Selangor: *Curtis* 3763, 3764. Singapore: *Maingay* (K.D.) 983 (the No. 1948 quoted by Pierre); *Jas. Collins* (a pustulate form apparently diseased).

This species gives apparently the "taban sutra" or "taban putih" guttapercha, which is not one of the best quality.

Var. *glabrata* King & Gamble. *Leaves* smaller, about 1·5 in. broad, glabrate beneath, rarely slightly golden-pubescent; *fruit* oblong; *branchlets* grey, very rough with scars of fallen leaves and flowers.

Perak: *Wray* 511 (*part*), 518.

P. Oxleyanum, Burck Ann. Jard. Buit. v. (1886) 33, is a different plant altogether (see Teysmann's specimen in Herb. Kew).

6. Palaquium xanthochymum, Pierre ex Burck in Ann. Jard. Buit. V. 30 (1885). A large handsome tree; the stem reaching 80 to 120 feet in height and 2·5 to 3 feet in diam.; branchlets dark brown, innovations rusty-pubescent; leaf-bud scales lanceolate, ciliate, about ·1 in. long. *Leaves* coriaceous, glossy-green; obovate, obtuse and often emarginate at apex, cuneate at base; glabrous on both surfaces, margin recurved, reddish when dry; 2·5 to 4 in. long, 1·5 in. broad; midrib prominent,

impressed above; main-nerves obscure, about 12 to 14 pairs at about 60° with the midrib; reticulations scarcely visible; petiole ·5 to ·6 in. long, channelled above by the decurrent margins of the blade; stipules ovate, ciliate, very small, caducous. *Flowers* fascicled, up to 8 together, in the axils of the leaves or of the scars below them; pedicels slender, recurved, ·2 in. long; buds very small, conical. *Calyx-lobes* 6, ·1 in. long; 3 outer valvate, 3 inner imbricate, ovate-acute, rusty-pubescent. *Corolla* campanulate, ·3 in. long, tube short; lobes 6, imbricate, oblong, blunt. *Stamens* 12, inserted on the top of the tube; filaments stout, curved; anthers ovate-sagittate, mucronate, extrorse. *Ovary* rounded, glabrous; style ·1 in. long, subulate. *Fruit* an ovoid berry, glabrous. *Isonandra xanthochyma*, de Vriese Nat. Tijdschr. Ned. Ind. XXI. 311, and Miq. Journ. Bot. Neerl. i. 259. *Dichopsis rubens*, Clarke in Hook. f. Fl. Br. Ind. III. 543.

PERAK: *King's Collector* 7288—on low ground and rich soil. MALACCA: *Maingay* (K.D.) 995. SINGAPORE: *Cantley* 63; *Ridley* 3774. —DISTRIB. Borneo.

Produces a guttapercha of a yellowish colour and second quality (de Vriese).

7. PALAQUIUM BANCANUM, Burck in Ann. Jard. Buit. V. 43 (1885). A very large evergreen tree; stems reaching 80 to 100 feet (Curtis), 100 to 120 feet (Kunstler) in height, with a girth of 10 to 12 feet; branchlets rough, prominently marked with the scars of fallen leaves, upper branchlets and innovations slightly but minutely rusty-pubescent. *Leaves* coriaceous; clustered at the ends of the branchlets, obovate or obovate-oblong, abruptly and very shortly acute at the otherwise rounded apex, cuneate at base; margins slightly recurved; glabrous on both surfaces, the lower with very minute glandular scales; 3 to 4 in. long, 1·5 to 2·5 in. broad; midrib prominent, impressed above; main-nerves very obscure, about 14 to 16 pairs, inclined at nearly 70° to midrib and at first parallel, afterwards arching, reticulations very faint; petiole ·7 to 1 in. long, edged above with the decurrent margins of the blade, glabrous. *Flowers* fasciculate, clustered about 2 to 4 together in the axils of the leaves or of the scars of fallen leaves, often on a length of as much as 4 to 5 in. of the branchlet; pedicels and calyx minutely ferruginous-pubescent; pedicels ·1 to ·15 in. long, thick. *Calyx-lobes* 6, the 3 outer valvate rounded, the 3 inner imbricate acute, ·15 to ·2 in. long. *Corolla* campanulate, tube as long as calyx; lobes 6, ovate, spreading, as long as tube, glabrous except a slight rusty pubescence within. *Stamens* 12, the 6 longer opposite to, the 6 shorter alternate with, the corolla-lobes; filaments inserted on the top of the tube, slender; anthers ovate, apiculate, extrorse. *Ovary* flattened-

cylindrical, the top rusty-hirsute; style as long as corolla, subulate, glabrous; cells 6. *Fruit* a fleshy oblong or obovate berry, smooth, ·75 in. long, ·5 in. thick, 1-seeded.

PENANG: *Curtis* 3583, 3659. PERAK: *Wray* 3984; *King's Collector* 6506, 6509. SINGAPORE: *Ridley* 6019, 6134, 6502, 6507; *Fox* 11307 at Bukit Timah; *Cantley* 73.—DISTRIB. Bangka.

Said to give a kind of "guttapercha."

8. PALAQUIUM RIDLEYI, King & Gamble, n. sp. A tree (?); branchlets blackish-grey, rough, innovations minutely rusty-pubescent. *Leaves* chartaceous-coriaceous; elliptic or elliptic-obovate, obtuse, emarginate or slightly acute at apex, cuneate at base; glabrous on both surfaces, margins slightly recurved; 2 to 3 in. long, 1 to 2 in. broad; midrib broad; main-nerves 8 to 10 pairs, starting at an angle of about 50° with the midrib, curving upwards to and along the margin, ·2 to ·3 in. apart; reticulations many, transverse, impressed above; petiole ·5 to ·7 in. long flattened and bordered by the decurrent broad margins of the blade; stipules small, ovate, hirsute, caducous. *Flowers* small, fascicled in groups of 6 or 7 together in the axils of the uppermost leaves; pedicels rather thick, about ·25 in. long, sparsely appressed-pubescent. *Calyx-lobes* 6, ·1 in. long; 3 outer rounded, shortly mucronate, glabrous, wrinkled when dry; 3 inner thin, scarious on the margins, ciliate, rusty-pubescent on both sides. *Corolla* tubular-campanulate, ·15 in. long, glabrous; lobes 6, oblong, obtuse, erose at tip; tube as long as lobes. *Stamens* 12, inserted on the top of the tube opposite to and alternate with the lobes; filaments slender as long as the lobes; anthers ovate-acute. *Ovary* conical, glabrous below, villous above, surmounted by a conical thick style, ·05 in. long, 6-celled. *Fruit* not seen.

SINGAPORE: *Ridley* 3591A.

9. PALAQUIUM MICROPHYLLUM, King & Gamble, n. sp. A tree (?); branchlets rounded, rough, dotted with scars of fallen leaves and flowers; innovations dark ferruginous-pubescent. *Leaves* coriaceous; obovate, obtuse or slightly obtusely-acute at apex, cuneate at base; glabrous on both surfaces, margins recurved; 1 to 2 in. long, ·7 to 1 in. broad; midrib slender, impressed above; main-nerves indistinct, about 8 to 10 pairs, nearly at right angles to the midrib; reticulations very faint even when dry; petiole ·4 to ·5 in. long, bordered above by the decurrent margins of the blade. *Flowers* fascicled, 1 to 3 together, above the scars of fallen leaves on the past year's wood; pedicels ·2 in. long, rusty-pubescent. *Calyx-lobes* 6; outer 3 valvate, ovate-acute, ·15 to ·2 in. long, densely tawny-pubescent; inner 3 imbricate, ovate,

blunt, scarious and ciliate on the margins, tawny-pubescent on the back, ·1 to ·15 in. long. *Corolla* tubular-rotate; the tube very short, scarcely ·05 in. long; the 6 lobes oblong or nearly spathulate, ·1 to ·15 in. long, reflexed in flower, sparsely hairy without. *Stamens* 12, filaments slender, recurved; anthers ovate, ·075 in. long, bi-mucronate. *Ovary* tawny-villous, conical; style ·15 to ·2 in. long, straight; cells 6. *Fruit* not seen.

SINGAPORE: at Bukit Timah, *Ridley* 10840.

10. PALAQUIUM HEXANDRUM, King & Gamble. A tree; branchlets light brown, innovations ferruginous-pubescent. *Leaves* chartaceous, glabrous; elliptic-oblong, shortly and bluntly acute at apex, attenuate and more or less unequal at base; 4 to 5 in. long, 2 to 2·5 in. broad; midrib thick, prominent; main-nerves 10 to 13 pairs, starting at about 65° to midrib then arched upwards, reticulations obscure. *Flowers* fasciculate, 3 to 4 together in the axils of the leaves or the scars of fallen leaves; pedicels slender, ·4 in. long, minutely pubescent. *Calyx-lobes* 6; 3 outer valvate, 3 inner more or less imbricate, pubescent outside, ciliate, ·05 to ·07 in. long, apex scarcely acute. *Corolla* campanulate; tube ·1 in. with a ring of hairs near the mouth inside; lobes 6, imbricate, ·15 in. long, oblong obtuse, spreading. *Stamens* 12, inserted on the top of the tube, 6 opposite to and 6 alternate with the lobes, the alternate ones shorter; filaments slender; anthers exsert, ovate-lanceolate, bi-mucronate, as long as filaments. *Ovary* rounded, thickly rusty-pubescent; style subulate, ·25 in. long. *Fruit* a fleshy berry, about ·75 in. in diam., smooth, 1-seeded. *Seed* ovoid, ·7 in. long, ·5 in. broad, scarcely flattened; testa thin, brown, shining; hilum very large, occupying about one-half of the seed; albumen none. *Dichopsis hexandra*, Clarke in Hook. f. Fl. Br. Ind. iii. 543. *Isonandra hexandra*, Griff. Notul. IV. 292. *Payena Griffithii*, Kurz For. Fl. II. 121, and Journ. As. Soc. Beng. XLVI. ii. 230 (*fide* Clarke, *but with doubt*).

MALACCA: *Griffith* (K.D.) 3609; *Maingay* (K.D.) 984. SINGAPORE: *Ridley* 11373.—DISTRIB. Burma (?)

11. PALAQUIUM HERVEYI, King & Gamble, n. sp. A large tree; branchlets rather stout, dark brown; innovations minutely rusty-pubescent; leaf-bud scales lanceolate, ·15 in. *Leaves* chartaceo-coriaceous; elliptic or elliptic-obovate, very shortly acute or sometimes emarginate at apex, cuneately attenuate often unequally at base; glabrous above except on midrib and nerves, sparsely rusty-pubescent beneath, afterwards glabrate, cinereous when dry; 2 to 3·5 in. long, 1·25 to 1·75 in. broad; midrib prominent; main-nerves 5 to 7 pairs at about 45° with the midrib and arching upwards, reticulations obscure; petiole ·5 in. long

bordered above by the decurrent margins of the blade, rusty-pubescent. *Flowers* small, fascicled 4 to 6 together in the axils of the leaves or on tubercles above the scars of fallen leaves; pedicels ·3 in. long, slender, decurved, pubescent; buds very small, globose. *Calyx* 6-lobed, 3 outer valvate, and 3 inner imbricate, ·1 in. long, lobes ovate acute, pubescent. *Corolla* campanulate; tube short, rusty-hirsute without; lobes 6, oblong-linear, recurved in flower, hairy within at the base, ·15 in. long, imbricate. *Stamens* 12; filaments long, exsert; anthers ovate, mucronate, extrorse, as long as filaments, hirsute. *Ovary* sub-globose, rusty-pubescent, 6-celled; style slender, ·3 in. long; stigma capitate. *Fruit* not seen.

PERAK: *Wray* 1104. MALACCA: *Maingay* (K.D.) 995; *Scortechini* 1892; *Hervey*. Vern. "Jongek" (Hervey).

Wray says the gutta is sticky and worthless.

12. PALAQUIUM STELLATUM, King & Gamble. A large tree, stems reaching over 100 feet in height; branchlets rather thick, dark brown, rough with the scars of fallen leaves; innovations ferruginous-pubescent. *Leaves* membrano-chartaceous, clustered at the ends of the branchlets; oblong-lanceolate, shortly acuminate at apex, cuneate at base; nearly glabrous above, pale and when young tomentose beneath, rusty-stellate-tomentose (Scortechini) on the nerves on both sides; 3 to 6 in. long, 1 to 1·5 in. broad; midrib prominent; main-nerves 10 pairs, starting at about 60° with the midrib and at once curving upwards; reticulations prominent on both sides in an elegant network; petiole ·75 to 1 in. long, slender, densely rusty-pubescent. *Flowers* fasciculate, 3 to 5 together in the axils of the upper leaves, forming almost a terminal leafy corymb of about 20 to 25 flowers; pedicels slender, about 1 in. long, densely rusty-pubescent. *Calyx-lobes* 6, densely rusty-pubescent, in 2 series; the outer of 3 valvate, ovate, rounded lobes, the inner of 3 ovate ciliate lobes with scarious margins; both ·25 to ·3 in. long. *Corolla* campanulate, ·3 to ·4 in. long, the tube a little shorter than the lobes; the lobes imbricate, twisted in bud, rounded at top, glabrous. *Stamens* 12 in one series; filaments on the base of the tube and attached to it, free above, ·2 in. long, thickened below, slender above; anthers oblong-lanceolate, apiculate, extrorse, ·1 in. long, glabrous. *Ovary* rusty-pubescent, sub-globose; style slender, ·35 in. long; cells 6 (?). *Fruit* not seen. *Dichopsis stellata*, Scortechini MS. in Herb. Calc.

PERAK: *Scortechini*, 1855.

A very distinct species, looking very like a *Bassia*. Scortechini says it yields good gutta, but in small quantities.

8. MIMUSOPS, Linn.

Trees with milky juice. *Leaves* chartaceous or coriaceous, with many usually inconspicuous parallel main-nerves. *Flowers* solitary or fascicled in the axils of the upper leaves on the branchlets. *Calyx-lobes* 6 or 8, in 2 series, the outer valvate enclosing the inner imbricate. *Corolla* with short tube; lobes 18 or 24 or more in 2 rows, one-third of the number in the inner, the rest in the outer, row; lobes of the outer row often divided.[*] *Stamens* 6 or 8, attached to the corolla-tube opposite the inner lobes; filaments short, dilated, free or connate in a tube with the staminodes; anthers lanceolate, extrorse, usually apiculate by the production of the connective. *Staminodes* alternate with and as many as the stamens, sub-petaloid, usually fimbriate. *Ovary* hirsute, 6–8-celled. *Fruit* a globose or ovate fleshy berry, epicarp crustaceous; seeds few or solitary. *Seeds* ovate or oblong, often oblique, slightly compressed; hilum basal or lateral; testa hard, shining; albumen fleshy, thin; cotyledons flat, leafy.—DISTRIB. Species about 30; in the tropics of both hemispheres.

Calyx-segments 8; stamens 8; staminodes acuminate, hairy .. 1. *M. Elengi.*
Calyx-segments 6; stamens 6; staminodes fimbriate, glabrous .. 2. *M. Kauki.*

1. MIMUSOPS ELENGI, Linn. Sp. Pl. 349 (1753). An evergreen tree, stems reaching 40 to 50 feet in height, and with a large girth; ultimate branchlets with dark brown rusty pubescence. *Leaves* chartaceous; elliptic, shortly acuminate at apex, rounded (often unequally), at base; glabrous on both surfaces, shining above; margins slightly recurved; 3 to 5 in. long, 1·5 to 2·5 in. broad; midrib prominent, raised on both surfaces; main-nerves numerous, the first pair from the base forming intra-marginal nerves, which are looped where they meet the 14 to 16 pairs of main-nerves; secondary nerves like the main-nerves and, with the reticulations, forming an elegant network; petiole ·6 to 1 in. long, slender; stipules triangular-subulate, very small, ferruginous-pubescent, very caducous. *Flowers* white, fragrant, solitary or in fascicles of 2 to 6 in the axils of the upper leaves; pedicels ·3 to ·7 in. long, often deflexed, appressed-ferruginous-pubescent; buds ovoid, acute. *Calyx-lobes* 8, ·3 in. long, ovate-lanceolate, acuminate; the 4 outer valvate, broader than the 4 inner imbricate and channelled on the back; all rusty-pubescent without, glabrous within. *Corolla* with a very short tube, scarcely over ·05 in. long; lobes 24, in 2 rows, the 16 outer linear-lanceolate, the 8 inner rather broader and shorter, linear-oblong. *Stamens* 8,

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[*] The outer corolla-lobes are now usually considered to be of the character of stipules to the inner row which constitute the regular petals.

opposite the lobes of the inner row; filaments slender, ·05 in. long; anthers oblong, glabrous, apiculate. *Staminodes* alternate with the anthers, oblong-lanceolate, acuminate, toothed, clothed on the back and sides with pale stiff hairs. *Ovary* silky-pubescent, 6-celled; style slender, grooved, as long as corolla. *Fruit* an ovoid berry about 1 in. long; yellow when ripe, 1- rarely 2-seeded. *Seed* oblong, ·75 in. long, ·5 broad and about ·25 thick, rounded above, hollowed at base where is the small oval hilum; testa crustaceous, dark brown, shining; albumen thin; cotyledons oblong, leafy, nearly as large as the seed cavity; radicle inferior. Roxb. Cor. Pl. I. 15. t. 14, and Fl. Ind. II. 236; Gaertn. f. Fruct. I. 198, t. 42; Lamk. Ill. t. 300; Baillon Hist. Pl. XI. 267, figs. 302–309; Engl. & Prantl Pflanzenfam. IV. i. 152, fig. 82 E–J; Burck Ann. Jard. Buit. V. (1886) 61; Wall. Cat. 4146; A. DC. Prod. VIII. 202; Clarke in Hook. f. Fl. Br. Ind. III. 548; Dalz. & Gibs. Bomb. Fl. 140; Wight Ic. t. 1586; Brandis For. Fl. 293; Bedd. Fl. Sylv. t. 40; Kurz in Journ. As. Soc. Beng. XLVI. ii. 231, For. Fl. II. 123; Trimen Fl. Ceyl. III. 86; Prain Beng. Pl. 649; Cooke Fl. Bomb. II. 95. *M. obtusifolia*, Bl. Bijdr. 672. "*Elengi*" Rheede Hort. Mal. I. 33 t. 20. Rumph. Herb. Amb. II. 189 t. 63.

PERAK: *Scortechini* 1122. MALACCA: *Griffith* (K.D.) 3612; *Maingay* (K.D.) 995/2, 998; *Cuming* 2265.—DISTRIB. India, Ceylon, Burma, cultivated in other tropical regions; the fallen corollas are used to make garlands.

2. MIMUSOPS KAUKI, Linn. Sp. Pl. 349 (1753). A large evergreen tree; branchlets thick greyish-brown, extremities somewhat ferruginous-scaly or -pubescent. *Leaves* coriaceous, clustered towards the ends of the branchlets; obovate or elliptic-obovate, obtuse, emarginate or very slightly acute at apex, cuneate at base; glabrous above, densely and smoothly grey-silky-pubescent beneath; the margins slightly recurved; 2 to 4 in. long, 1·25 to 2·75 in. broad; midrib prominent; main-nerves very indistinct, about 14 to 16 pairs, parallel, meeting near the edge in a looped intramarginal nerve; petiole ·5 to 1·5 in. long, moderately thick, channelled above. *Flowers* thickly clustered towards the ends of the branchlets; pedicels ·75 to 1 in. long, appressed grey-silky-pubescent, angular. *Calyx-lobes* 6, ·25 in. long; 3 outer valvate, ovate, acute, grey-silky-pubescent; 3 inner imbricate, similar but rather thinner. *Corolla* with a very short tube and 18 (or more, exceptionally) lobes in 2 rows; the outer row 12, lanceolate, acute; the inner 6, spathulate; all ·1 in. long or nearly so, glabrous. *Stamens* 6 to 8, usually 6, extrorse; filaments ·1 in. long, conical, glabrous; anthers ·1 in. long, linear, blunt. *Staminodes* alternating with the stamens, ·2 to ·25 in. long, cuneate, deeply and irregularly fimbriate at apex.

Ovary villous, ovoid, 6-celled; ovules elliptic; style exsert, ·4 in. long, slender. *Fruit* an ovoid rough berry, ·1 in. long, 2–4-seeded. *Seeds* obliquely obovoid, somewhat curved near the base, ·6 to ·7 in. long by ·4 to ·5 in. broad and ·4 in. thick; hilum lateral towards the base, ·35 in. long, linear-oblong; testa thick, crustaceous, chestnut-brown; albumen thin; cotyledons flat, leafy, oblong, ·3 to ·35 in. long; radicle inferior, rather large. Wall. Cat. 4149E (*upper half*); A. DC. Prod. VIII. 203; Clarke in Hook. f. Fl. Br. Ind. III. 549; Miq. Fl. Ind. Bat. II. 1042; Koord. & Val. Bijdr. I. 156; Burck in Ann. Jard. Buit. V. (1886) 64. *M. Balata*, Gaertn. f. Fruct. III. 133. *M. Balota*, Bl. Bijdr. 673. *M. Hookeri*, A. DC. Prod. VIII. 204. *M. Bojeri*, A. DC. l.c. 205 (*fide Miquel*). *M. dissecta*, R. Br. Prod. 531. *M. Browniana*, Benth. Fl. Austral. IV. 285.—Rumph. Herb. Amb. iii. 19. t. 8 *flor. exc.*

PERAK: *Scortechini*. MALACCA: *Griffith* (K.D.) 3614; *Maingay* (K.D.) 987.—DISTRIB. Amherst in Burma, *Wallich*; Malay Islands; tropical Australia—cultivated elsewhere for its edible fruit.

The following new species from the Andaman Islands seems worthy of description here.

MIMUSOPS ANDAMANENSIS, King & Gamble, n. sp. A tree (?); branchlets slender, grey; innovations, with inflorescence and leaf-petioles, covered with appressed pale tawny tomentum. *Leaves* coriaceous; elliptic-obovate, shortly acute at apex, cuneate at base; margins recurved; glabrous on both surfaces; 3 to 4 in. long, 2 to 3 in. broad; midrib slender; main-nerves about 15 pairs, parallel, very inconspicuous, secondary nerves similar to main-nerves, less prominent; petiole slender, ·75 to 1 in. long, channelled above. *Inflorescence* of 1–3-flowered sessile umbels in the axils of the upper leaves; pedicels slender, ·8 to 1 in. long, angular; buds ovoid-conical, ·4 in. long. *Calyx-lobes* 8 in 2 series; outer 4 lanceolate, acuminate, valvate, reflexed when open, ·4 to ·5 in. long; inner 4 as long, linear-lanceolate, deeply channelled on the back, scarcely imbricate. *Corolla-lobes* 24, the inner series of 8, oblong-lanceolate, glabrous, obtuse, each bearing behind it two narrow acute, simple or deeply bifid lobes, rather shorter than and narrower than the 8 inner lobes. *Stamens* 8, opposite the inner corolla-lobes, and shorter than them; filaments slender, slightly hirsute, ·075 in. long; anthers linear-sagittate, the connective produced in a long apiculus, often bifid. *Staminodes* alternate with the stamens and rather shorter than them, densely hirsute, linear-lanceolate, long acuminate, midrib black. *Ovary* rounded, 8-lobed, pubescent; style subulate, glabrous, stigma minutely cleft; cells 8, each with a narrow central ovule. *Fruit* unknown.

Hill jungle near Port Mouat, S. Andaman, *King's Collector*.

In the characters of the corolla-lobes this species seems to be intermediate between *Mimusops* and *Imbricaria*, and, since Engler has recently reduced *Imbricaria* to a section of *Mimusops*, we have no hesitation in describing it under that genus.

Order LXXII. EBENACEÆ.

Shrubs or trees with usually hard wood. *Leaves* alternate, rarely sub-opposite, entire, usually coriaceous, ex-stipulate. *Flowers* usually diœcious, regular; the females usually (and the males sometimes) solitary; the males (and the females occasionally) in short, usually bracteate, axillary or extra-axillary cymes; pedicels articulated. *Calyx* inferior, gamosepalous, campanulate or tubular, with 3 to 7 valvate, imbricate or contorted, often accrescent, lobes. *Corolla* gamopetalous, variously shaped; the lobes 3 to 7, usually contorted, sometimes imbricate or valvate in bud. *Stamens* in the ♂ and ☿ flowers in a single series, and as many as the corolla-lobes, or 2- or more-seriate and 2 or more times as many; filaments shorter than the anthers, free or in pairs, or variously connate below; anthers linear, usually with longitudinal dehiscence, the connective often apiculate; in the ♀ flowers reduced to staminodes with empty or abortive anthers, or absent. *Disk* none. *Carpels* in the ♂ flowers abortive or absent; in the ☿ or ♀ flowers connate into a sessile superior ovary, with 2 to 8 usually more or less united styles; the cells as many as or twice as many as the styles with imperfect septa; ovules twice as many as the styles, anatropous, pendulous from the inner angles of the cells. *Fruit* a coriaceous or fleshy berry, several- or few-seeded. *Seeds* pendulous, usually oblong, vertically furrowed; testa thin; albumen copious, uniform or ruminate; embryo axial; radicle superior.—DISTRIB. About 320 species, in the tropics generally.

Flowers often 3-merous; ovary 3- or 6-celled .. .. .. 1. MABA.
Flowers mostly 4–5-merous; ovary 4–5 or 8–10-celled .. .. 2. DIOSPYROS.

1. MABA, Forst.

Trees or shrubs; leaves alternate, entire. *Flowers* diœcious (monœcious in *M. Maingayi*), axillary, shortly pedicellate or in small dense cymes; usually 3-merous, rarely 4- or 5-merous. *Calyx* 3- to 5-fid or partite, rarely sub-truncate, often cup-shaped and accrescent. *Corolla-tube* usually longer than the calyx; lobes of the limb 3, twisted to the right hand. *Male flowers: stamens* 3 to 21; filaments distinct, in pairs or otherwise united; anthers oblong; ovary rudimentary. *Female flowers: staminodes* 0 to 12; *ovary* 3-celled or perfectly or imperfectly 6-celled, 6-ovulate. *Fruit* ellipsoid or globose, baccate, glabrous or hairy, 1–6-celled and 1–6-seeded, rather dry or fleshy; albumen not ruminate.—DISTRIB. Species about 70; tropical.

Leaves opposite or almost opposite .. .. .. 1. *M. Hierniana.*
Leaves alternate:—
  Leaves puberulous on the lower surface, their veins prominent.. 2. *M. venosa.*
  Leaves densely velvety pubescent on the lower surface, their veins obsolete .. .. 3. *M. olivacea.*
  Leaves glabrous or nearly so:—
    Leaves broadly ovate or elliptic, 3 to 5 in. long and 1·65 to 2·65 in. broad; main-nerves 3 to 5 pairs .. .. 4. *M. merguensis.*
    Leaves oblong to oblong-lanceolate 1·5 to 3 in. long and ·65 to 1·35 in. broad:—
      Main-nerves 6 or 7 pairs; fruit globular .. .. 5. *M. Clarkeana.*
      Main-nerves obsolete; fruit obliquely ellipsoid .. .. 6. *M. perakensis.*
    Leaves polymorphous (mostly elliptic obovate or sub-rotund); fruit globular, fusiform .. .. 7. *M. buxifolia.*

1. MABA HIERNIANA, King & Gamble, n. sp. A small glabrous shrub; young branches much thinner than a goose-quill, pale, glabrous. *Leaves* opposite, thinly coriaceous; oblong-elliptic, the apex shortly acuminate, the base cuneate, the edges slightly recurved when dry; both surfaces hepatic-brown when dry and shining, the reticulations on the upper distinct; main-nerves 8 to 10 pairs, curved, ascending and forming wide arches near the edge, prominent on the lower surface, faint on the upper; the midrib bold on both; length 6 to 10 in.; breadth 2 to 3·5 in.; petioles ·3 to ·6 in. *Male flowers* unknown. *Female flowers* rotate, ·4 in. across, almost sessile, in axillary or extra-axillary fascicles of 2 or 3. *Calyx* spreading, divided almost to the base into 3 to 5 rotund, minutely crenate, slightly imbricate lobes. *Corolla* nearly twice as long as the calyx, deeply divided into 5 broadly oblong blunt lobes with slightly recurved edges; staminodes 3 or 4, with short thick filaments and broad antherodes. *Ovary* depressed-hemispheric, with short, thick, conical style and small stigma. *Fruit* not seen.

PERAK: *King's Collector* 7920.

2. MABA VENOSA, King & Gamble. A tree 15 to 50 feet high; young branches twice as thick as a crow-quill, the bark pale and deciduously cinereous-puberulous. *Leaves* alternate, thinly coriaceous; oblong-elliptic, acute or shortly acuminate, the base slightly cuneate or rounded; both surfaces dark olivaceous when dry; the upper shining, glabrous except the puberulous depressed midrib and main-nerves; the reticulations minute but distinct; lower puberulous everywhere and the midrib prominent; main-nerves 6 to 9 pairs, prominent, curved, spreading, interarching boldly near the edge; length 4·5 to 6·5 in.; breadth 2 to 3 in.; petioles ·35 to ·5 in. *Male* and *female flowers* alike, in densely crowded extra-axillary cymose fascicles of 5 or 6, not longer than the petioles; flowers mostly sessile, one or

two in each fascicle on a short densely hairy pedicel, rotate, ·3 or ·4 in. in diam. *Calyx* very coriaceous, divided to the base into 3 spreading broadly ovate lobes with broad blunt apices and concave bases, partly adpressed-pilose and partly glabrescent. *Corolla* smaller and less coriaceous than the calyx, tubular, glabrous, its lobes ovate-elliptic. *Male flowers* with 6 stamens in 2 rows, 3 of them small; anthers cordate, filaments flat; rudimentary ovary ovoid, apiculate, with a dense ring of coarse hair at its base. *Female flowers* with a few flat staminodes; the ovary broadly ovoid apiculate, hirsute in its lower part; styles 3, glabrous, distinct, the stigmas broad. *Fruit* ovoid-globular, glabrous, ·75 in. long and ·6 in. in diam., blunt at apex and base, the latter subtended by the 3- sometimes 4-lobed, thick, almost woody, accrescent calyx, its lobes spreading, their edges reflexed. *Seeds* elliptic, plano-convex. *Diospyros venosa*, Wall. Cat. 4126.

SINGAPORE: *Ridley* 4961; *King's Collector* 3495, 3862, 7643.

3. MABA OLIVACEA, King & Gamble, n. sp. A tree 50 to 70 feet high; young branches half as thick as a goose-quill, puberulous, pale cinereous when dry. *Leaves* coriaceous, alternate; elliptic, shortly and abruptly apiculate, the base rounded or cuneate, the edges much recurved when dry; upper surface olivaceous, shining, glabrous except the depressed rusty-puberulous midrib; lower surface softly velvety-pubescent, olivaceous, the hair on the bold midrib and 5 to 8 pairs of curved spreading rather prominent main-nerves rusty; length 3 to 5·5 in.; breadth 1·5 to 2·25 in.; petiole ·4 in., tomentose. *Male flowers* sessile, ·15 in. long, in branched condensed axillary and extra-axillary cymes less than 1 in. long; bracteoles broad, blunt, small. *Calyx* ·1 in. long, tubular-campanulate, tomentose outside, glabrous inside, divided nearly to the base into 4 broadly ovate obtuse erect lobes. *Corolla* cylindric-campanulate, glabrous except the hairy edges of the 4 oblong lobes. *Stamens* 8 large and 4 small, lanceolate, on short filaments. *Female flowers* not seen. *Fruit* ellipsoid, blunt at each end, the apex crowned by the short style, glabrous, about ·5 in. long, and ·4 in. in diam. *Calyx* at the base of the fruit thick, spreading, ·6 in. across, with 4 ovate, blunt lobes with reflexed edges.

PERAK: *King's Collector* 7877; *Wray* 1269. LANKAWI: *Curtis* 1661.

4. MABA MERGUENSIS, Hiern in Trans. Camb. Phil. Soc. XII. 134 (1873). A small, nearly glabrous tree; young branches thicker than a crow-quill. *Leaves* alternate, thinly coriaceous, ovate or elliptic, shortly and obtusely acuminate, the base cuneate or rounded; main-nerves 3 to 5 pairs, slightly curved, ascending; length 3 to 5·5 in.; breadth 1·65 to 2·65 in.; petiole about ·25 in. long. *Male flowers* in dense minutely

pubescent branching axillary cymes only 1 to 1·5 in. in diam. *Calyx* less than ·25 in. long, with 3 or 4 obtuse triangular lobes. *Corolla* slightly larger than the calyx, shortly 3- or 4-lobed. *Stamens* 14 to 16, glabrous; rudimentary ovary minute. *Female flowers* 3- or 4-merous. *Calyx* lobed half-way down. *Corolla* 3- or 4-merous; *Staminodes* 3 or 4. *Ovary-cells* 6, 1-ovulate. *Styles* 3, distant, glabrous. *Fruit* sub-globular; its calyx ·5 in. in diam. with 3 ovate acute spreading lobes. Kurz in Journ. As. Soc. XLVI., ii. 232, and For. Fl. II. 139; Clarke in Hook. f. Fl. Br. Ind. III. 552.

PENANG: *Helfer* (K.D.) 3618; *Curtis* 705, 718.—DISTRIB. Burma.

Very imperfectly represented in Herbaria.

5. MABA CLARKEANA, King & Gamble, n. sp. A tree 20 to 30 feet high; young branches twice as thick as a crow-quill, puberulous when young, ultimately glabrous, cinereous with small black striæ. *Leaves* alternate, coriaceous; oblong, the apex blunt and sometimes minutely notched, the base cuneate; upper surface olivaceous, glabrous, shining when dry; lower surface dull, paler, sparsely and deciduously adpressed-pubescent and the minute reticulations rather distinct; main-nerves 6 or 7 pairs, spreading, very faint on both surfaces; midrib bold in the lower, depressed on the upper surface; length 1·5 to 3 in., breadth ·65 to 1·25 in.; petioles ·1 in. long. *Male flowers* small (only ·1 to ·15 in. long), crowded in sessile cymes ·25 to ·5 in. long, in the axils of the upper leaves, with a few oblong bracteoles. *Calyx* sessile or sub-sessile, adpressed-pubescent outside, glabrous inside, divided half-way down into 3 sub-erect broadly ovate acute lobes. *Corolla* smaller than the calyx, densely sericeous outside, glabrous inside, divided to the base into 3 ovate-lanceolate, with an inner row of 3 or 6 similar but narrower, lobes. *Stamens* 6, in pairs, joined by the bases of their broad filaments; anthers lanceolate. *Female flower* unknown. *Fruit* globular, ·35 in. in diam., glabrous. *Calyx* at its base thick, with 3 obtuse angles. *Seeds* 3, 3-sided, ·25 in. long.

PERAK: *King's Collector* 4816.

6. MABA PERAKENSIS, King & Gamble, n. sp. A tree 50 to 60 feet high; young branches as thick as a crow-quill, minutely puberulous becoming glabrous, dark-coloured, sub-glaucous. *Leaves* coriaceous, alternate; rather broadly oblong to oblong-lanceolate, the apex acute, the base broad and rounded or slightly cuneate; both surfaces dark olivaceous, the upper shining, the lower dull; main-nerves obsolete; midrib minutely pubescent, prominent on the lower surface, depressed on the upper; length 2·5 to 3 in., breadth ·75 to 1·35 in.; petioles

·15 in. long. *Male flowers* about ·15 in. long, 8 or 10 together in dense sessile axillary clusters not much exceeding the petioles. *Calyx* sessile or nearly so, campanulate, slightly pubescent outside, glabrous inside, deeply divided into 3 broadly ovate acute lobes. *Corolla* tubular; adpressed-sericeous externally, glabrous inside, cut half-way down into 3 ovate acute lobes. *Stamens* 12, 6 of them united by the bases of their filaments; anthers of all lanceolate apiculate, their bases cordate. *Female flower* not known. *Fruit* obliquely ellipsoid, the apex shortly apiculate, glabrous; the calyx at the base sub-ligneous, flat, deeply divided into 3 broad ovate-rotund lobes with reflexed edges and blunt tips. *Seeds* 2, oblong.

PERAK: *Wray* 3130; *King's Collector* 3945, 5519.

7. MABA BUXIFOLIA, Pers. Syn. II. (1807) 606. A bush or small tree; young branches puberulous at first, ultimately glabrous. *Leaves* small, alternate, coriaceous; varying from elliptic to obovate, the apex sub-acute or obtuse, the base always narrowed; upper surface olivaceous, the lower brown; the midrib bold; reticulations rather distinct on the upper surface only; main-nerves 4 to 6 pairs, spreading, slightly prominent on the upper surface, indistinct on the lower; edges slightly recurved; length ·35 to 1 in.; breadth ·3 to ·6 in.; larger in the varieties; petiole less than ·5 in. *Flowers* solitary, or 2 to 3 in short cymes, 3-merous. *Calyx* ·1 in. long, campanulate, with short triangular lobes. *Corolla* campanulate with short triangular lobes. *Male flowers: stamens* 6 to 12, glabrous; rudimentary ovary hairy. *Female flower:* stamens none; *ovary* 3-celled; style at the apex 3-lobed. *Fruit* globose or ellipsoid, ·35 in. long, 1-seeded. *Calyx* at its base cupular, often very short; albumen equable. Wight Ic. t. 763; A. DC. Prod. VIII. 240; Thwaites Enum. Pl. Ceyl. 183; Trimen Fl. Ceyl. III. 89; Hiern in Trans. Camb. Phil. Soc. XII. 116; Kurz For. Fl. II. 139; Clarke in Hook. f. Fl. Br. Ind. III. 551. *M. littorea*, Br. Prod. 527. *M. Cumingiana*, *M. madagascariensis*, *M. guineensis*, *M. Smithiana*, A. DC. l.c. 241. *M. neilgherrensis*, Wight Ill. t. 148 *bis*. E. *M. Ebenus*, Wight Ic. tt. 1288–9 (*not of* Spreng.). *Maba ?* Wall. Cat. 7461. *Ferreola buxifolia*, Roxb. Cor. Pl. I. 35, t. 45, and Fl. Ind. III. 790.

MALACCA: *Maingay* (K.D.) 979; *Griffith* (K.D.) 3641. LANGKAWI: *Curtis* 2557. PENANG: *Curtis* 708.—DISTRIB. Malay Archipelago, Br. India, N. Australia, Philippines, tropical Africa.

A variable species, of which two varieties are recognised by Mr. C. B. Clarke in Hooker's "Flora of British India." Both these have leaves longer than as above described, but neither occurs in our region.

2. DIOSPYROS, Linn.

Trees, rarely shrubs. *Leaves* alternate or rarely sub-opposite, entire. *Flowers* diœcious, very rarely polygamous, axillary and short-pedicelled, or in small cymes; the ♀ often, and the ♂ sometimes, solitary; usually 4- or 5-merous, rarely 3-merous. *Calyx* usually deeply-lobed, rarely truncate, often in the ♀ larger than in the ♂ and often accrescent and plicate or auriculate in fruit. *Corolla* tubular with short deep lobes, or salver-shaped, or campanulate; the lobes contorted to the right in bud. *Stamens* in the ♂ *flowers* 4 to 64, often 16; their filaments distinct, paired or polyadelphous; anthers linear, rarely short; *ovary* rudimentary. In the ♀ *flowers*, *staminodes* 0 to 16; *ovary* 4–5-celled or imperfectly 8–10-celled; the cells usually with 1, rarely with 2 ovules; styles or stigmas 1 to 4. *Fruit* a globose, ellipsoid or ovoid-conic, berry, usually subtended by the enlarged (sometimes woody) calyx; flesh pulpy or viscid. *Seeds* oblong, usually compressed; albumen equable or (rarely) ruminate.—DISTRIB. About 220 species, chiefly in the tropics.

Leaves membranous or thinly coriaceous, glabrous or hairy; ♂ flowers in small cymes or fascicles, 4–5-merous; stamens usually 8, 12, or 16; flowers sub-solitary; ♀ calyx longer than that of the ♂, not accrescent or but slightly so, in fruit:—

- Leaves under 5 in. long:—
  - Fruit globular, glabrous; stamens 16 .. .. 1. *D. Wrayi.*
  - Fruit cylindric or oblong-conical, glabrous; stamens about 16; leaves 1 to 1·4 in. long, and under ·65 in. broad .. 3. *D. microphylla.*
  - Fruit ellipsoid:—
    - Stamens 8:—
      - Fruit puberulous:—
        - Leaves usually under 2·25 in. long, lanceolate or sub-rhomboidal .. .. 2. *D. subrhomboidea.*
        - Leaves usually over 2·25 in. long, elliptic-oblong .. 6. *D. Scortechinii.*
      - Fruit glabrous; leaves 2·5 to 4·5 in. long .. 5. *D. graciliflora.*
    - Stamens 12; leaves 3·25 to 5 in. long; fruit glabrous .. 7. *D. flavicans.*
  - Fruit not known; stamens 12; leaves under 2 in. long .. 4. *D. dumosa.*
- Leaves over 5 in. long; fruit ovoid-conic, rusty-setose; stamens 6 to 12 .. .. 8. *D. apiculata.*

Leaves coriaceous, upper surface glabrous and shining; flowers mostly 4-merous, a few 5-merous; ♂ flowers in small cymes or clusters; calyx deeply lobed, often larger in the ♀ and differing in shape from that of the ♂:—

- Calyx 4-lobed:—
  - Leaves under 5 in. long:—
    - Leaves under 1·5 in. broad:—
      - Calyx of ♀ flower densely sericeous-pubescent, lobes reniform; fruit ovoid or sub-globose, rusty villous, its calyx 1 in. in diam. .. .. .. 9. *D. lanceæfolia.*

Calyx-margins of ♀ flower tomentose, lobes broadly ovate; fruit globose, ultimately glabrous, ·75 in. long 14. *D. lucida.*

Leaves 1·5 to 2·5 in. broad:—

Stamens about 12; main-nerves of leaves 8 to 9 pairs 10. *D. pachyphylla.*

Stamens about 16; main-nerves of leaves 6 to 7 pairs 11. *D. clavigera.*

Stamens 16, in pairs; main-nerves of leaves 5 pairs 13. *D. styraciformis.*

Leaves usually more than 5 and less than 7·5 in. long:—

Leaves under 6·5 in. long, over 2·5 in. broad; fruit olive-shaped, nearly 2 in. long and 1·25 in. in diam. .. 12. *D. bilocularis.*

Leaves under 2·5 in. broad:—

Leaves under 6·5 in. long; main-nerves of leaves not visible, probably many pairs; fruit depressed-globose, 1·35 in. in diam.; persistent calyx thick, woody .. 25. *D. oleifolia.*

Leaves under 7·5 in. long; main-nerves 5 to 8 pairs; fruit ellipsoid, 1 in. in diam.; persistent calyx with large membranous lobes .. .. .. 27. *D. paniculata.*

Leaves usually more than 6 and less than 12 in. long:—

Leaves beneath covered with appressed sericeous hair; stamens 20 to 24; main-nerves of leaves not visible .. 21. *D. argentea.*

Leaves beneath glabrous except the midrib, which is covered with dark hair; main-nerves of leaves 7 to 8 pairs; fruit glabrous .. .. .. 17. *D. tristis.*

Leaves beneath glabrous or only minutely puberulous:—

Leaves usually 3 to 3·5 in. broad:—

Main-nerves of leaves 8 to 10 pairs; apex caudate-acuminate, base cuneate .. .. .. 18. *D. pauciflora.*

Main-nerves of leaves 10 to 12 pairs; apex acute, base rounded .. .. 19. *D. ellipsoidea.*

Leaves reaching 4 in. broad; fruit glabrescent:—

Main-nerves of leaves 8 to 14 pairs; apex sub-acute 23. *D. Horsfieldii.*

Main-nerves of leaves 16 to 20 pairs; apex shortly acuminate .. .. 24. *D. toposioides.*

Leaves 3·5 to 4·5 in. broad; main-nerves of leaves 8 to 12 pairs; apex acute; fruit densely rusty-tomentose, ridged .. .. 28. *D. Kunstleri.*

Leaves 8 to 14 in. long, 2·5 to 5 in. broad; main-nerves 14 to 18 pairs; fruit sub-globose, 1 in. in diam., immersed in the thickened calyx .. .. 20. *D. Wallichii.*

Leaves 10 to 18 in. long, 2 to 4 in. broad; main-nerves 14 to 20 pairs; fruit depressed-globose, 2 in. in diam., seated on a cupular calyx .. .. .. 22. *D. rigida.*

Calyx 5-lobed:—

Leaves glabrous beneath, 7 to 9 in. long, 3 to 3·75 in. broad; main-nerves 16 to 18 pairs .. .. 15. *D. oblonga.*

Leaves puberulous on the midrib and main-nerves beneath, 5·5 to 7·5 in. long, 2·5 to 3·25 in. broad; main-nerves 10 to 12 pairs .. .. 16. *D. Helferi.*

Leaves glabrous beneath, 5·5 to 9 in. long, 1·5 to 2·5 in. broad; main-nerves 10 to 12 pairs .. .. 26. *D. brachiata.*

Leaves thinly coriaceous, glabrous above, puberulous beneath; both ♂ and ♀ flowers in few-flowered cymes, on long, slender, extra-axillary peduncles, pendulous; calyx 5-lobed, not accrescent in fruit .. .. 29. *D. nutans.*

SPECIES IMPERFECTLY KNOWN.

Calyx of fruit long, woody, its lobes pointed and much reflexed, leaves glabrous	30. *D. reflexa.*
Leaves oblong, hairy beneath, cordate at the base. Calyx in fruit small. Fruit globular, rusty-pubescent	31. *D. penangiana.*
Leaves quite glabrous, elliptic, narrowed at each end, not cordate. Fruit globular with small calyx	32. *D. rufa.*
Leaves coriaceous, quite glabrous, oblong, areolar-reticulate. Male flowers in terminal tomentose cymes	33. *D. areolata.*
Leaves membranous, oblong or oblong-elliptic, glabrous. Female flowers in fascicles of about 3. Calyx with reniform lobes; pedicels bi-bracteolate. Corolla salver-shaped	34. *D. Curtisii.*
Leaves membranous, puberulous beneath. Male flowers in dense short hairy glomeruli. Stamens 8	35. *D. glomerulata.*
Leaves puberulous beneath. Calyx-lobes 4; stamens 16 ..	36. *D. caliginosa.*

1. DIOSPYROS WRAYI, King & Gamble, n. sp. A shrub 4 to 12 feet high; young branches as thick as a crow-quill, cinereous- or rusty-puberulous. *Leaves* small, alternate, membranous; ovate-lanceolate to narrowly elliptic, shortly acuminate, the base cuneate; both surfaces dark olivaceous; the upper very shining and minutely reticulate, glabrous except the puberulous depressed midrib; the lower more brown and dull, the midrib pubescent and prominent, the reticulations less distinct; length 2 to 4 in., breadth ·75 to 1·5 in.; petioles ·05 to ·1 in. *Male flowers* ·25 in. long, 2 to 4 together in small axillary cymes, black when dry, puberulous, pedicels very short. *Calyx* less than ·1 in. long, narrowly campanulate with 4 deep ovate lobes. *Corolla* three times as long as the calyx, salver-shaped, sub-glabrous; limb with 4 oblong lobes. *Stamens* 16, united in pairs by the bases of the unequal filaments, broadly lanceolate, inserted near the base of the tube. *Female flowers* like the ♂ but longer—especially the calyx. *Staminodes* about 8, lanceolate. *Ovary* glabrescent, ovoid-conic, tapering into a rather long style; stigmas 4, fleshy, short. *Fruit* globular, crowned by the short style, glabrous, shining, black when ripe (when dry); calyx at its base ·75 in. across, coriaceous, deeply divided into 4 oblong blunt or sub-acute reflexed lobes.

PERAK: *Scortechini; Wray* 2764, 3272, 3955; *King's Collector* 2076, 2993.

2. DIOSPYROS SUB-RHOMBOIDEA, King & Gamble, n. sp. A shrub 4 to 6 feet high; young branches thinner than a crow-quill, softly tawny-pubescent, pale brown when dry. *Leaves* small, alternate; lanceolate or ovate-lanceolate or sub-rhomboidal, bluntly acuminate, the base cuneate; both surfaces olivaceous-brown when dry, the upper dark, glabrous except the puberulous midrib, the lower sparsely adpressed pubescent especially on the bold midrib; main-

nerves 4 or 5 pairs, curved, ascending, faint on both surfaces; length 1·5 to 2·25 in., breadth ·6 to ·8 in.; petiole about ·1 in. *Male flower* ·6 in. long, solitary, axillary on a short tomentose pedicel with 2 broad bracteoles. *Calyx* less than ·1 in. long, pubescent outside, glabrous inside, deeply divided into 4 broad obtuse almost quadrate imbricate lobes. *Corolla* salver-shaped; the tube cylindric, tapering to the apex, tomentose outside; limb as long as the tube but less hairy outside, glabrous inside like the tube, deeply divided into 4 oblong sub-acute lobes with inflexed edges, twisted to the right in bud. *Stamens* 8, attached near the bottom of the tube, 4 shorter than the others; anthers all lanceolate, and on short filaments. *Female flower* not known. *Fruit* ellipsoid, sparsely adpressed-puberulous, crowned by the conic style, ·8 or ·9 in. long and ·4 in. in diam. *Calyx* at its base ·25 in. across, flat, with 4 spreading, broad, blunt lobes.

PERAK: *Wray* 4055; *King's Collector* 7302.—DISTRIB. Sumatra, *Forbes* 2004.

3. DIOSPYROS MICROPHYLLA, Bedd. Ic. Pl. Ind. Or. 27, t. cxxxiii. (1874), and Fl. Sylv. Madr. cxlv. A tree 20 to 30 feet high; young branches as thick as a crow-quill or thinner, densely pubescent. *Leaves* thinly coriaceous, alternate, distichous; ovate-lanceolate, sub-rhomboid, the apex sub-acute, the base cuneate; upper surface dark olivaceous-brown, glabrous except the pubescent depressed midrib; the lower dark brown, puberulous, the midrib pubescent; main-nerves obsolete on both surfaces; length 1 to 1·4 in., breadth ·45 to ·65 in.; petiole ·05; the largest leaves towards the ends of the branches. *Male flowers* solitary or 3 together in a minute cyme. *Calyx* ·05 long, deeply 4-lobed, tube glabrate. *Corolla* slightly longer than the calyx with 4 rounded lobes. *Stamens* about 16. *Female flowers* ·2 in. long, axillary, solitary, pedicellate or in a pair on a short peduncle. *Calyx* campanulate, deeply divided into 4 sub-rotund imbricate very obtuse lobes, sericeous on the middle outside and on the edges, otherwise glabrous. *Corolla* salver-shaped, somewhat longer than the calyx, deeply cut into 4 unequal rotund lobes, adpressed-puberulous on the back of the lobes, otherwise glabrous. *Ovary* ovoid, sericeous near the apex and base; style thick, 2-fid; stigmas 4. *Ovary* 4-celled, ellipsoid, conic, 4-celled, cells 1-ovuled. *Fruit* cylindric or oblong-conical, dry, glabrous, 1-celled, 1- rarely 2-seeded, ·75 to 1 in. long. Clarke in Hook. fil. Fl. Br. Ind. III. 559. *D. buxifolia*, Hiern in Trans. Camb. Phil. Soc. XII. 218. *D. vaccinioides*, Wall. Cat. 4130 (*in part*). *Leucoxylum buxifolium*, Blume Bijdr. 1169; Miq. Fl. Ind. Bat. II. 1050; Choisy Mem. Ternstr. 43 t. 2.

MALACCA: *Griffith* (K.D.) 3643; *Walker* 170; *Maingay* (K.D.) 966. SINGAPORE: *Ridley* 6045. PENANG: *Curtis* 1513, 7175. PERAK:

Scortechini 2052.—DISTRIB. Andaman Islands, South India, Malay Archipelago.

4. DIOSPYROS DUMOSA, King & Gamble, n. sp. A small tree; young branches as thick as a crow-quill, glabrous, dark-coloured when dry. *Leaves* small, alternate, membranous; lanceolate, shortly acuminate, the base cuneate; upper surface dark olivaceous when dry, glabrous; lower yellowish, slightly puberulous on the slightly prominent midrib and 4 or 5 pairs of curved ascending nerves; length 1·5 to 2 in.; breadth ·5 to ·75 in.; petiole ·05 in. *Male flowers* ·5 in. long, in small axillary sessile fascicles of 3 or 4. *Calyx* ·25 in. long, deeply divided into 3 or 4 ovate-lanceolate acuminate lobes, concave along the midrib, and with undulate edges, pubescent. *Corolla* twice as long as the calyx, narrowly tubular, deeply divided into 4 narrow oblong glabrous lobes, the tube pubescent inside and outside. *Stamens* 12, inserted at its base on unequal slender filaments; anthers broadly lanceolate, much apiculate. *Female flowers* solitary, axillary, shortly pedicellate, ·4 in. long. *Calyx* cleft to the base into 4 large broadly ovate reniform bluntly acuminate undulate lobes, sparsely adpressed-pubescent on both surfaces, ·25 in. long and as much across. *Corolla* a little longer but less hairy than the calyx, fleshy, tubular, tetragonous, divided for half its length into 4 narrow oblong lobes. *Staminodes* 8, linear-lanceolate, apiculate, on slender filaments. *Ovary* narrowly ellipsoid, tapering to the rather long style, glabrous. *Fruit* unknown.

PERAK: *Wray* 3508. JUNKSEYLON (Tongka): *Curtis* 2907.

5. DIOSPYROS GRACILIFLORA, Hiern in Trans. Camb. Phil. Soc. XII. 191 (1873). A glabrous tree 40 to 50 feet high; young branches less than half as thick as a goose-quill, deciduously puberulous, dark-coloured and striate when dry. *Leaves* thickly membranous, alternate; rather narrowly elliptic, shortly and bluntly apiculate to caudate-acuminate, the base much narrowed and often slightly oblique; both surfaces dull dark olivaceous-brown when dry, glabrous except for some minute hairs on the nerves beneath; main-nerves about 5 pairs, curved, ascending, depressed or obscure on the upper surface, pale and slightly prominent on the lower like the midrib; length 2·5 to 4·5 in., breadth ·75 to 1·35; petioles ·1 to ·2 in. *Male flowers* ·5 in. long, few together, in small axillary cymes about as long as the petioles, sessile, puberulous. *Calyx* large, two-thirds to one-half the length of the corolla, but much wider, deeply divided into 4 large ovate-rotund undulate semi-erect lobes. *Corolla* narrowly tubular, one-third to one-half longer than the calyx; the tube externally with 4 lines of pubescence, otherwise glabrescent; limb with 4 deeply oblong broad blunt glabrous spreading sub-undulate lobes. *Stamens* 8, in two rows,

4 of them smaller than the other 4; anthers linear-lanceolate, apiculate, the filaments flat, very short; rudimentary ovary small, narrowly ovate, glabrous. *Female flowers* like the ♂ and often mixed with them, but sometimes solitary. *Ovary* broadly ovoid, with short style, glabrous. *Fruit* ellipsoid, 1 in. long and ·75 in. in diam., glabrous, crowned by the short remains of the style, and subtended by the calyx with 4 spreading, undulate, sub-glabrous lobes. *D. flavicans*, Hiern in Trans. Camb. Phil. Soc. XII. 205 (*as to female plant partly*). *D. decipiens*, Clarke in Hook. fil. Fl. Br. Ind. III. 563.

MALACCA: *Maingay* (K.D.) 972 (♀ *only*). PERAK: *Scortechini* 181, 198; *Wray* 1298, 2843, 3214, 4227; *King's Collector* 884, 3298, 3354, 3366, 3588, 3394, 5173, 6742, 7990, 10463. PENANG: *Curtis* 3041.—DISTRIB. Java, *Beccari* 1560.

6. DIOSPYROS SCORTECHINII, King & Gamble, n. sp. A tree 15 to 30 or even 50 feet high; young branches as thick as a crow-quill, tawny-puberulous, angled, pale when dry. *Leaves* alternate, small, membranous; narrowly elliptic-oblong, acuminate, much narrowed at the base to the short petiole; both surfaces olivaceous-brown when dry, the upper glabrous, the lower often puberulous, especially on the midrib; main-nerves 8 to 12 pairs, spreading, curved, ascending, somewhat distinct on the lower surface, faint on the upper as are the transverse reticulations; length 2 to 4 in., breadth ·6 to 1·25 in.; petiole ·1 to ·15 in. *Male flowers* ·5 in. long, in shortly pedunculate axillary fascicles of 2 or 3, or solitary and pedicellate. *Calyx* ·1 in. long, tomentose outside, glabrous inside, ·1 in. long, campanulate, deeply divided into 4 broad almost truncate lobes. *Corolla* coriaceous, ·3 in. long, glabrous; tube tapering a little to the apex; lobes 4, oblong, sub-acute, spreading. *Stamens* 8; anthers shortly lanceolate, as long as the filaments. *Female flowers* longer than the ♂, solitary, the pedicel as long as the calyx, tomentose. *Ovary* ellipsoid, densely pilose; style short, conic; stigmas small, glabrous. *Fruit* ellipsoid, crowned by the very short style, puberulous. *Calyx* at its base cupular, ·2 in. across, tomentose outside, ·75 in. long and ·4 in. in diam.

PERAK: *Curtis* 2092; *King's Collector* 2407, 4126, 5002, 5296, 6356; *Scortechini* 377; *Wray* 638.

7. DIOSPYROS FLAVICANS, Hiern in Trans. Camb. Phil. Soc. XII. 205 (1873). A tree 40 to 70 feet high; young branches rather thicker than a crow-quill, cinereous-puberulous becoming glabrous. *Leaves* alternate, thinly coriaceous; elliptic to oblong-elliptic, apex shortly acuminate, the base cuneate; upper surface when dry olivaceous, glabrous, the lower pale brown, densely puberulous on the stout midrib; main-nerves 5 to

7 pairs, curved, ascending; length 3·25 to 5 in., breadth 1·35 to 2·5 in.; petioles ·1 to ·15 in. *Male flowers* ·45 in. long, 2 to 6 together, in axillary or extra-axillary bracteate sessile tomentose fascicles. *Calyx* sub-sessile, campanulate, pubescent outside, glabrous inside; the limb deeply divided into 5 broadly ovate, bluntly acuminate spreading lobes. *Corolla* salver-shaped; tube slightly inflated and glabrous in the lower half outside, cylindric and pubescent in the upper half, inside glabrous; limb with 4 broadly oblong obtuse glabrescent spreading lobes. *Stamens* 12, of different lengths, attached in 3 rows in the tube; anthers lanceolate-cordate, apiculate; filaments slender and of varying length; rudimentary ovary none. *Female flowers* conspicuously bi-bracteate, in cymes like the ♂ but shortly pedunculate. *Calyx* as in the ♂ but less deeply lobed. *Fruit* ellipsoid, not much narrowed at the ends, slightly tetragonous, glabrous, ·75 in. long and about ·35 in. in diam., crowned by the short remains of the style; the calyx clasping its base, about half as long, with 4 deep triangular lobes. *Seeds* 4, ridged. Clarke in Hook. fil. Fl. Br. Ind. III. 562; Kurz in Journ. As. Soc. Beng. XLVI., ii. 236, For. Fl. II. 135. *Guatteria? flavicans*, Wall. Cat. 7295. *Ebenacea*, sp. 2, Griff. Notul. IV. 291.

MALACCA: *Griffith* (K.D.) 454, 3623; *Maingay* (K.D.) 972 (*as to male plant only*); *Helfer* (K.D.) 3639? PENANG: *Curtis* 1602. SELANGOR: *Ridley* 10556. PERAK: 2058; *King's Collector* 2480, 3354, 3380, 3774, 6149, 6633, 10007.

8. DIOSPYROS APICULATA, Hiern in Trans. Camb. Philos. Soc. XII. 186 (1873). A shrub or small tree; young branches half as thick as a goose-quill, fulvous-hirsute. *Leaves* alternate, membranous; oblong or elliptic-oblong, sometimes rather oblanceolate, finely caudate-acuminate, slightly narrowed to the rounded or somewhat cuneate base; both surfaces dark olivaceous-brown when dry, transversely reticulate; upper surface sparsely adpressed-pubescent, the midrib and main-nerves pubescent and slightly depressed; lower surface darker, and with many long rather coarse hairs, especially on the prominent midrib and 8 to 10 pairs of slightly curved ascending main-nerves; length 5·5 to 7 in., breadth 1·5 to 2·5 in.; petiole ·1 in., tomentose. *Male flowers* about 3 together, axillary, sub-sessile, ·35 in. long. *Calyx* 4- to 5-partite, about ·25 in. long, pubescent, lobes narrowly lanceolate. *Corolla* tubular, 4-lobed, ·4 in. long, the lobes spreading, oval, obtuse. *Stamens* 6 to 12, unequal, glabrous; anthers linear-oblong, acuminate; filaments often geniculate, dilated and somewhat united at the base, rudimentary ovary small, hairy. *Female flowers* 1 to 3 together on short axillary, minutely hispid cymes.

Fruit sub-sessile, solitary, ovoid-conic, finely rusty-setose, especially in the upper half, about 1 in. long and ·5 to ·75 in. across, apiculate. *Seeds* about 4, albumen not ruminate. Clarke in Hook. fil. Fl. Br. Ind. III. 553.

Malacca: *Maingay* (K.D.) 1514. Perak: *King's Collector* 5127, 6770. Penang: *Curtis* 1584.

9. Diospyros lanceæfolia, Roxb. Hort. Beng. 93 (1814). A tree; young branches twice as thick as a crow-quill, adpressed-puberulous, dark brown when dry. *Leaves* alternate, coriaceous; oblong, lanceolate or oblong-lanceolate, acute or acuminate, the base rounded or cuneate, the edges recurved; both surfaces olivaceous-brown when dry, the upper darker and shining, the lower paler and dull; main-nerves 7 to 9 pairs, spreading, faint on both surfaces; midrib bold on the lower surface, depressed on the upper; length 2 to 3 in.; breadth ·65 to 1 in.; petiole ·15 to ·2 in. *Male flowers* sessile in clusters. *Calyx* ·15 in. long with 4 ovate tawny-sericeous lobes. *Corolla* ·35 to ·5 in. long, narrowed upwards, the lobes ·15 in. long. *Stamens* about 16; anthers linear, glabrous or slightly pilose at the base; filaments minutely pilose. *Female flowers* solitary or in pairs on the branches below the leaves, ·5 in. long. *Calyx* ·3 in. long, very coriaceous, densely sericeous-pubescent on both surfaces, deeply divided into 4 erect, broadly reniform, acute lobes. *Corolla* a little longer than the calyx, densely sericeous-tomentose outside, the tube glabrous inside; lobes of limb 4, oblong, very thick. *Staminodes* 8, linear compressed. *Ovary* broadly ovate, acuminate, densely silky; stigmas 4, glabrous. *Fruit* ovoid or sub-globose, rusty-villous; its *calyx* 1 in. in diam. with thickened tube and spreading lobes. Roxb. Fl. Ind. II. 537; A. DC. Prod. VIII. 232; Hiern in Trans. Camb. Phil. Soc. XII. 213; Kurz in Journ. As.. Soc. XLVI., ii. 236, and For. Fl. II. 136; Clarke in Hook. fil. Fl. Br. Ind. III. 562. *D. multiflora*, Wall. Cat. 4144; A. DC. l.c. 231. *D. amœna*, Wall. Cat. 4139; A. DC. l.c. 231.

Singapore: *Ridley* 4964. Pahang: *Ridley* 1601.—Distrib. Assam range of hills, Burma, Sumatra.

The chief characters separating this from *D. lucida*, Wall., are the longer lobes of the calyx of the female flower and the somewhat larger and more hairy fruit. This species is not common within our area, whereas *D. lucida* is a common tree.

10. Diospyros pachyphylla, Clarke in Hook. fil. Fl. Br. Ind. III. 568 (1882). A tree; young branches rather thinner than a goose-quill, deciduously puberulous, soon glabrous. *Leaves* coriaceous, alternate; elliptic or oblong, sub-acute, the base rounded; both surfaces when

dry rather pale olivaceous-brown, glabrous; the upper shining, the lower glaucous, dull; main-nerves 8 or 9 pairs, curving upwards, faint on both surfaces midrib bold on the lower surface, depressed on the upper; length 3 to 5 in., breadth 1·5 to 2·5 in.; petiole ·25 to ·4 in *Male flowers* in short rusty-pubescent axillary and extra-axillary cymes from ·5 to ·75 in. long, bracts ovate, ·1 in. long. *Calyx* ·15 in. long, campanulate, adpressed rusty-tomentose on both surfaces, cut half-way into 4 broad triangular erect lobes. *Corolla* tomentose externally (*fide* C. B. Clarke) nearly ·5 in. long, its lobes about ·1 in. *Stamens* about 12; anthers linear, with villous connective and glabrous filaments. *Female flowers* unknown. *Fruit* globular, the apex concave and bearing the short remains of the style, ·65 in. in diam., minutely rusty adpressed-pubescent, becoming glabrous; the *calyx* at its base woody, cupular, with 4 broad lobes with reflexed apices.

MALACCA: *Maingay* (K.D.) 974. SINGAPORE: *Ridley* 5644.

This does not agree with *D. undulata*, Wall., of which Hiern, in Trans. Camb. Phil. Soc. XII. 215, makes it a variety. It comes much nearer to, but is smaller in all its parts than, the plant named by us *D. Wallichii*, which was originally issued as *D. macrophylla*, Wall. Cat. 4141.

11. DIOSPYROS CLAVIGERA, Clarke in Hook. fil. Fl. Br. Ind. III. 558 (1882). A tree; all parts glabrous except the minutely pilose-ciliate margin of the calyx. *Leaves* alternate, coriaceous, elliptic, tapering slightly to each end (sub-rhomboidal); both surfaces warm brown when dry, the upper glabrous, shining, the lower dull; main-nerves 6 or 7 pairs, little curved, ascending, slightly prominent on the lower surface, faint on the upper; length 3·25 to 4·5, breadth 1·5 to 2·15 in.; petioles ·15 to ·2 in. *Male flowers* 3 to 16 together in small sub-sessile axillary and extra-axillary cymes. *Calyx* ·15 in. long, deeply divided into 4 obtuse lobes. *Corolla* (in bud) ·35 in. long, clavate, glabrous outside, the upper part very thick, 4-lobed. *Stamens* about 16, glabrous; anthers oblong, shortly apiculate. *Female flower* and fruit unknown. *D. Ebenum*, Hiern (*not of Koenig*) in Trans. Camb. Phil. Soc. XII. 208 (*in part*).

MALACCA: *Maingay* (K.D.) 971; *Griffith* (K.D.) 3635. LANGKAWI: *Curtis* 3418. SINGAPORE: *Maingay* 5066.

12. DIOSPYROS BILOCULARIS, Oliver in Hook. Ic. Pl. t. 2336 (1894). A glabrous tree 60 to 80 feet high; young branches about the thickness of a goose-quill, dark purplish when dry and shining, slightly striate. *Leaves* thickly coriaceous; elliptic, sub-acute, the base slightly cuneate, the edges (when dry) recurved; both surfaces olivaceous when dry, the upper shining, the lower paler and dull; midrib inconspicuous and

slightly channelled on the upper surface, bold on the lower; main-nerves 10 to 12 pairs, slightly curved, spreading, interarching far from the edge, faint on both surfaces; length 5 to 6·5 in., breadth 2·5 to 3·25 in. *Male flowers* ·65 in. long (in bud) on rusty-pubescent pedicels ·3 to ·4 in. long, in axillary and extra-axillary fascicles of 2 to 4, with a few tomentose bracteoles at their bases. *Calyx* very coriaceous, ·25 in. long and nearly as much in width at the mouth; limb 4-lobed, the lobes very short and broad. *Corolla* narrowly tubular, ·4 in. long, very thick; lobes of limb long, narrowly oblong. *Stamens* 16; sub-sessile, linear, sub-equal, apiculate; rudimentary ovary none. *Female flower;* calyx and corolla as in the ♂, staminodes none; *ovary* oblong or oval-ovoid, narrowed at the apex, longer than the calyx, 2-celled; ovules 2 in each cell and pendulous. *Fruit* olive-shaped, shortly apiculate, 1·5 to 2 in. long and 1 to 1·25 in. in diam. at the middle, yellow when ripe; its pedicel obconic, stout, woody, ·4 in. long; calyx in ripe fruit flat, with 4 broad blunt lobes. *Seed* solitary; pericarp thin, only ·3 in. across, albumen large stellately ruminate. *Maba Maingayi,* Hiern in Trans. Camb. Phil. Soc. XII. 107; Clarke in Hook. fil. Fl. Br. Ind. III. 552.

MALACCA: *Maingay* (K.D.) 976; *Derry* 1092. SINGAPORE: *Ridley* 27, 2755, 4920. PERAK: at elevations of 1,500 to 2,000 feet, *King's Collector* 7383.

13. DIOSPYROS STYRACIFORMIS, King & Gamble, n. sp. A tree (?); young branches rusty-pubescent, slightly thicker than a crow-quill. *Leaves* thinly coriaceous; elliptic to elliptic-lanceolate, the apex sub-acute or acute, the base cuneate; upper suface dark olivaceous, shining, glabrous except the depressed midrib; the lower surface dull, paler, with deciduous rufous pubescence, especially on the prominent midrib; main-nerves about 5 pairs, ascending, little curved, slightly prominent on the lower surface only; length 2·5 to 4 in., breadth 1 to 2 in.; petiole ·2 to ·35 in. *Male flowers* a few together in short cymes grouped in small axillary clusters. *Calyx* ·2 in. long, narrowly campanulate, densely rusty-tomentose externally like the corolla, the mouth with deep narrowly-triangular teeth. *Corolla* ·5 in. long, narrowly tubular, cut half-way down into 4 oblong blunt lobes. *Stamens* 16, in pairs, unequal, linear, apiculate; filaments unequal in length; rudimentary ovary none. *Female flowers* solitary, calyx much longer than in the ♂; its 4 lobes thick, broad, reniform, rusty-pubescent. *Corolla* not known; *ovary* hairy. *Fruit* globose with the apex truncate and depressed in the middle, densely but minutely pale rusty-tomentose, ·5 in. long and about ·65 in. in diam. *Calyx* at its base deeply cupular with 4 spreading triangular teeth. *D. nov. spec.*, C. B. Clarke in Herb.

Kew. *D. hirsuta*, Linn. fil., ? var., Hiern in Trans. Camb. Phil. Soc. XII. 165.

Malacca: *Maingay* (K.D.) 969. Singapore: *Ridley* 3787.

Ridley's No. 1084, from Bukit Timah, in Singapore, seems to belong to this. The only specimen I have seen is imperfect.

14. Diospyros lucida, Wall. Cat. 4127 (1829). A tree 40 to 50 feet high; young branches from half as thick to as thick as a crow-quill, minutely puberulous, becoming glabrescent, dark-coloured. *Leaves* alternate, coriaceous; oblong or elliptic-oblong, sub-acute or obtuse, the base rounded or cuneate, sometimes a little oblique; both surfaces when dry pale olivaceous-brown, glabrous; main-nerves 5 to 9 pairs, spreading, curved, faint on the lower surface, slightly depressed on the upper; midrib bold on the lower surface, somewhat depressed on the upper; length 1·25 to 4·5 in., breadth ·5 to 1·5 in.; petioles ·2 to ·4 in. *Male flowers* sessile, in small fascicles. *Calyx* nearly ·15 in. long, campanulate, with 4 erect broadly triangular lobes, tomentose on both surfaces. *Corolla* narrowly tubular, more than twice as long as the calyx, tetragonous in bud, sericeous-tomentose outside, the tube glabrous inside; limb deeply divided into 4 narrowly oblong thick lobes. *Stamens* 12 to 16, in pairs united by their short filaments and face to face; anthers linear, glabrous, minutely apiculate, and on short sericeous filaments; rudimentary ovary linear. *Female flowers* 1 or 2 together, axillary or extra-axillary, sub-sessile. *Calyx* longer than in the ♂, lobed nearly to the base; lobes broadly ovate, their recurved margins minutely tomentose. *Fruit* globose, ·75 in. or more in diam., sub-truncate and slightly umbonate at the apex, adpressed rusty-pubescent at first, ultimately glabrous, 4–6-seeded; the accrescent *calyx* at its base woody, cupular, ·6 in. across with 4 short broad reflexed lobes; albumen of seed not ruminate. A. DC. Prod. VIII. 233; Clarke in Hook. fil. Fl. Br. Ind. III. 568. *D. hirsuta*, var. *lucida* Hiern in Trans. Camb. Phil. Soc. XII. 163(*not of* Linn. fil.)

Malacca: *Griffith* (K.D.) 3637; *Maingay* (K.D.) 970, 973, 977, 3,500; *Derry* 1439. Perak: *Scortechini*; *Wray* 3018, 3056. Penang: *Curtis* 250, 1602; *King's Collector* 1050, 1760. Singapore: *Ridley* 2119, 2749, 3580, 4962, 4963, 6129, 8115, 9212, 9517.

This is probably only a southern form of the Indian species *D. lanceæfolia*, Roxb.

15. Diospyros oblonga, Wall. Cat. 4124 (1829). A tree; young branches thinner than a goose-quill, purplish-brown when dry, glabrous. *Leaves* alternate, coriaceous, glabrous; oblong-elliptic, shortly and abruptly apiculate, the base rounded or slightly cuneate; both surfaces

faintly reticulate, quite glabrous, shining; main-nerves 16 to 18 pairs, spreading, little curved, interarching boldly at a little distance from the edges, prominent on the lower surface, depressed on the upper; midrib very bold on the lower surface, depressed on the upper; length 7 to 9 in., breadth 3 to 3·75 in.; petiole ·4 in., very stout. *Male flowers* about ·5 in. long, salver-shaped, in short axillary cymes, coriaceous, sub-sessile, ·5 in. long. *Calyx* and *corolla* everywhere adpressed-tomentose. *Calyx* shorter than the corolla, campanulate, cleft to near the base into 5 oblong, blunt, sub-erect lobes. *Corolla-tube* narrow, not constricted at the throat; limb with 5 large broad rotund lobes with recurved edges. *Stamens* 10, united in pairs by the bases of their filaments, the inner ones smaller, all inserted on the base of the calyx-tube. *Female flowers* 1 to 5 together, ·25 to ·3 in. long, with 5 deep ovate-oblong auriculate sub-plicate lobes. *Corolla* ·35 in. long, densely hairy outside, deeply lobed; staminodes 5; *ovary* 10-celled, rusty-hairy. *Fruit* sub-globose, sub-truncate at base and apex, glabrous when ripe; the hispid accrescent *calyx* ·75 in. across, its lobes auriculate; albumen of seed not ruminate. A. DC. Prod. VIII. 243; Hiern in Trans. Camb. Phil. Soc. XII. 243; Clarke in Hook. fil. Fl. Br. Ind. III. 569; Miq. Fl. Ind. Bat. II. 1045.

MALACCA: *Maingay* (K.D.) 967. PENANG: *Curtis* 1564, 2487. 3658. SINGAPORE: *Ridley* 2747, 3031, 6311. PERAK: *King's Collector* 3794, 4924, 7237, 8278.

16. DIOSPYROS HELFERI, Clarke in Hook. fil. Fl. Br. Ind. III. 569 (1882). A tree 20 to 30 feet high; young branches half as thick as a goose-quill, pale puberulous, the bark dark. *Leaves* alternate, coriaceous; elliptic or elliptic-oblong, sub-acute or obtuse, the base broad or sub-acute; the upper surface dark olivaceous-brown when dry, glabrous except the depressed puberulous midrib, the reticulations minute but distinct; lower brown, glabrescent but puberulous on the rather stout midrib and nerves; main-nerves 10 to 12 pairs, rather faint, spreading, horizontal, interarching boldly about ·25 in. from the edge; length 5·5 to 7·5 in., breadth 2·5 to 3·25 in.; petiole ·4 to ·5 in., stout, pubescent. *Male flowers* unknown. *Female flowers* ·5 in. long, axillary, solitary or 2 together, sessile. *Calyx* coriaceous, densely pubescent inside and out, deeply divided into 5 broadly oblong, sub-acute lobes, accrescent, and becoming concave along the midribs of the lobes. *Corolla* somewhat longer than the calyx, sericeous externally; the tube short, the limb-lobes deep, broadly oblong, blunt; staminodes few, flat. *Ovary* broadly ovoid, densely sericeous-tomentose. *Fruit* ovoid-ellipsoid, nearly 1 in. long, and slightly less in diam., glabrous; the accrescent *calyx* embracing its base deeply 5-lobed, plicate.

MALACCA: *Griffith* (K.D.) 3632. KEDAH: *Curtis* 2596, 8327?; *Ridley* 327.

17. DIOSPYROS TRISTIS, King & Gamble, n. sp. A tree 40 to 50 feet high; young branches half as thick as a goose-quill, covered with deciduous almost black tomentum. *Leaves* alternate, coriaceous; oblong-elliptic, shortly acuminate, the base rounded or cuneate; both surfaces dingy olivaceous-brown when dry, minutely reticulate; upper surface glabrous, shining, the lower dull, the prominent midrib densely clothed with dark hairs; the 7 or 8 pairs of prominent ascending main-nerves and the intermediate spaces with a few similar hairs with bulbous bases; length 6 to 9 in., breadth 2 to 2·75 in.; petioles ·4 to ·5 in. *Male flowers* ·3 in. long, in short axillary cymes ·75 in. long, the branches and pedicels densely dark rusty-tomentose outside. *Calyx* glabrous inside; the mouth with 5 broad short obtuse teeth. *Corolla* fleshy, glabrous, like the calyx in shape and of about the same length. *Stamens* 24; anthers lanceolate, shortly appendiculate at the apex, sessile. *Female flowers* unknown. *Fruit* depressed-globose, glabrous, shining, nearly 2 in. in diam.; the *calyx* at its base thick, woody, flat, 1·5 in. across, with 5 spreading triangular lobes.

PERAK: *Wray* 2190; *King's Collector* 5521.

18. DIOSPYROS PAUCIFLORA, King & Gamble, n. sp. A glabrous shrub or small tree; young branches rather thinner than a goose-quill, their bark dark and rough. *Leaves* rather large, alternate, very coriaceous; oblong-lanceolate or -oblanceolate, shortly caudate-acuminate, the base slightly cuneate; upper surface olivaceous, shining, lower ochraceous, dull; main-nerves 8 to 10 pairs, spreading, curved, and interarching boldly ·1 or ·2 in. from the slightly recurved edge; length 5 to 10 in., breadth 1·75 to 3 in.; petiole ·25 to ·3 in., corrugated. *Male flowers* ·3 in. long, sessile and in sessile axillary fascicles of from 3 to 6. *Calyx* ·25 in. long, narrowly tubular, somewhat narrowed at base and apex, coriaceous, pale in colour, the mouth with 4 broad triangular short erect lobes, outer surface with a layer of minute adpressed tawny tomentum and scattered over it many black adpressed hairs; the interior paler, pustular, with a few similar scattered hairs and a thick ring of them near the base surrounding the rudimentary ovary and clothing it also. *Corolla* slightly longer than the calyx, fleshy, widely tubular, divided for half its length into 4 broad obtuse lobes with a broad line of adpressed black hairs along the midrib of each outside, the rest of the outer surface adpressed-sericeous, the interior quite glabrous. *Stamens* 12, viz., 8 in pairs standing face to face and united by their short filaments, and 4 free; anthers of all linear, densely hairy, on short glabrous filaments. *Female flowers* not seen.

PERAK: *King's Collector* 7363, 7749.

19. DIOSPYROS ELLIPSOIDEA, King & Gamble, n. sp. A tree or shrub; young branches somewhat thinner than a goose-quill, deciduously and densely rusty-puberulous. *Leaves* alternate, thinly coriaceous; oblong to elliptic-oblong, rarely slightly oblanceolate, apex acute, base rounded; both surfaces when dry olivaceous-brown, the upper glabrous, the midrib sometimes rusty-puberulous, the lower surface darker, minutely puberulous; midrib and 10 to 12 pairs of curved ascending nerves faintly prominent on the lower and depressed on the upper surface; length 6 to 10 in.; breadth 2·25 to 3·5 in.; petioles ·25 to ·3 in. *Male flowers* in dense axillary cymes of 6 to 12, not much longer than the petioles; bracteoles few, broad, densely rusty-tomentose. *Calyx* sub-sessile, tomentose externally, glabrous internally, divided into 4 sub-rotund blunt lobes. *Corolla* glabrous, very fleshy towards the apex, with 4 broad deep lobes. *Stamens* at the base of the tube, broadly ovate, apiculate, filaments flattened. *Female flowers* in sub-sessile clusters of 3 or 4. *Calyx* with 4 rounded lobes, reflexed, coriaceous, and in fruit only ·35 in. across. *Fruit* ellipsoid, glabrous, crowned by the short style and subtended by the reflexed broadly-lobed small calyx, 1 to 1·25 in. long and ·8 in. in diam. *Seeds* few, ellipsoid, apiculate, two of the sides compressed.

PERAK: *King's Collector* 2233, 3250, 7098, 7269, 7320, 7689, 8215; *Scortechini* 1615.

20. DIOSPYROS WALLICHII, King & Gamble. A tree 30 to 60 feet high; young branches covered with minute coarse hair, the older verrucose. *Leaves* alternate, coriaceous; oblong or elliptic-oblong, apex acute, base cuneate or rounded; edges slightly recurved; upper surface glabrous and shining, lower paler, minutely pubescent at first but becoming glabrescent, both olivaceous when dry; midrib depressed on the upper surface, bold on the lower; main-nerves 14 to 18 pairs, slightly curved, spreading, prominent on the lower surface, faint on the upper; length 8 to 14 in., breadth 2·5 to 5 in.; petiole ·5 to ·75 in. *Male cymes* ·5 to ·75 in. long, in clusters (often crowded) on the branches, 7–10-flowered; bracteoles broad, blunt, concave, thick like the calyx and corolla, and like them densely rusty-tomentose externally. *Calyx* ·1 to ·15 in. long, tubular; the mouth with 4 blunt triangular erect teeth; tomentose on both surfaces. *Corolla* thrice as long as the calyx; narrowly tubular, glabrous inside. *Stamens* 16, in 2 rows, the inner attached to the outer at the bases of their filaments; all linear; rudimentary ovary small, hairy. *Female flower* rather larger than the ♂, but in smaller cymes; the *calyx* tetragonous and deeply grooved, very fleshy, becoming woody, very large and boldly 4-angled and

grooved in the ripe fruit. *Corolla* as in the ♂, but somewhat longer. *Staminodes* about 16. *Ovary* conical densely hairy; stigma glabrous, with 4 deep oblong truncate lobes. *Fruit* 1 in. in diam., nearly twice as much across the calyx, sub-globose, deeply immersed in the large thickened calyx, its apex truncate-concave; seeds 4 or 5. *D. macrophylla*, Wall. Cat. 4141 (*not of* Blume). *D. undulata*, Wall. A. DC. Prod. VIII. 233; Hiern in Trans. Camb. Phil. Soc. XII. 216 (*in part*); Kurz in Journ. As. Soc. Beng. XLVI. ii. 23, and For. Fl. II. 135 (*in part*); Clarke in Hook. fil. Fl. Br. Ind. III. 568.

PENANG: *Curtis* 1085; *Ridley* 7174. MALACCA: *Maingay* (K.D.), 974; *Griffith* (K.D.) 3636. PERAK: *Scortechini* 1976; *Wray* 2535, 2865. *King's Collector* 2966, 2982, 4058, 6779, 7459, 7619, 10123. KEDAK: *Curtis* 2594. SELANGOR: *Ridley* 2748, 8544.

This is the plant issued by Wallich as No. 4141 of his Catalogue under the name *D. macrophylla*. Being different from the older *D. macrophylla* of Blume, a new name had to be found for it. This was done by De Candolle, who reduced it, as a variety, to Wallich's *D. undulata* with the type specimen of which in Wallich's own herbarium it does not agree. De Candolle was followed by Hiern, Kurz, and Clarke; we now restore it to specific rank. The true *D. undulata*, Wall., is a Burmese species. It is found also in the Andaman Islands, but it has not as yet been collected in Malaya.

21. DIOSPYROS ARGENTEA, Griff. Notul. IV. 288 (1854). A tree 15 to 50 feet high; young branches about as thick as a goose-quill, covered with sub-deciduous yellowish silky hairs. *Leaves* large, coriaceous; oblong, apex acute, base rather abruptly cuneate or rounded; upper surface warm brown when dry, glabrous and shining, the midrib depressed; lower densely covered with yellowish adpressed sericeous hair, the midrib very stout; main-nerves invisible on both surfaces; length 6 to 10 in.; breadth 1·65 to 3·5 in.; petioles ·1 to ·25 in. *Male flowers* in somewhat supra-axillary few-flowered shortly pedunculate spike-like cymes 1 to 1·25 in. long (peduncle included); bracts ovate ·2 in. long. *Calyx* ·25 in. long, deeply 4-lobed, villous. *Corolla* ·35 in. long, tubular, lobed half-way down, very villous outside. *Stamens* 20 to 24. *Female flower* solitary on a peduncle ·2 in. long; calyx campanulate, ·5 in. long, with ovate lobes. *Corolla* ·65 in. long. *Staminodes* 4 to 5. *Ovary* 4-celled, 8-ovuled, densely hairy; styles 4, erect, hairy. *Fruit* ellipsoid, apiculate, 2 to 2·5 in. long and 1 to 2 in. in diam., densely rusty-tomentose; the *calyx* persistent, its lobes enlarged, broad, very coriaceous, shortly hairy. Hiern in Trans. Camb. Phil. Soc. XII. 262; Clarke in Hook. fil. Fl. Br. Ind. III. 569. *D. discolor*, Wall. Cat. 4131 (*not of* Willd.).

MALACCA: *Griffith* (K.D.) 3625; *Maingay* (K.D.) 968, 970; *Goodenough*

1301, 1476. SINGAPORE: *Ridley* 3648, 5898; *Hullett* 825. PERAK: *Wray* 172, 1392; *King's Collector* 4812, 5862, 6387, 6896, 8003, 8142; *Scortechini* 498. PANGKORE: *Curtis* 1365. SELANGOR: *Ridley*. 10271. PAHANG: *Ridley* in Trans. Linn. Soc. Ser. 2, III. 318 in Tahan woods.

22. DIOSPYROS RIGIDA, Hiern in Trans. Camb. Phil. Soc. XII. 257 (1873). A tree 30 to 60 feet high; young branches as thick as a goose-quill, minutely dark rusty-tomentose. *Leaves* alternate, very coriaceous, large; oblong or elliptic-oblong, equal-sided, the apex sub-acute, the base rounded and neither oblique nor cordate; upper surface dark olivaceous-brown when dry, shining, minutely reticulate; lower paler olivaceous-brown, covered except the midrib with a very thin film of minute tomentum, minutely reticulate; midrib very bold on the lower surface, pubescent at the sides, slightly depressed on the upper; main-nerves 14 to 20 pairs, spreading, interarching ·35 in. from the edge, slightly distinct on the lower surface, invisible on the upper; length 10 to 18 in., breadth 2 to 4 in.; petiole ·4 to ·6 in., very stout. *Male flowers* when in bud ·4 in. long and nearly ·3 in. in diam., few, in short extra-axillary cymes, densely covered with black tomentum; the pedicels stout, deflexed, about ·75 in. long. *Calyx* densely tomentose, ovoid, tapered to the apex, its mouth with 4 broad shallow blunt teeth. *Corolla* (apparently) not much longer than the calyx, very coriaceous, glabrous, the tube ovoid; the lobes short, oblong, blunt. *Stamens* about 20, inserted at the base of the tube, unequal; anthers lanceolate, apiculate, almost sessile. *Female flowers* unknown. Ripe *fruit* in cymes, depressed-globose, glaberulous, with a woody rind, 1·75 in. in length from base to apex and 2 in. in diam.; remains of style none; *calyx* at base of fruit cupular, 1·5 in. across, divided into 4 reticulate leathery spreading broadly ovate lobes; peduncle ·75 to 1·25 in. long, with dark hispid hairs.

PERAK: *King's Collector* 4024, 5732, 5971, 6801; *Wray* 3708.—DISTRIB. Borneo.

23. DIOSPYROS HORSFIELDII, Hiern in Trans. Camb. Phil. Soc. XII. 193 (1873). A tree 20 to 40 feet high, all parts except the cymes glabrous; young branches thinner than a goose-quill, pale. *Leaves* alternate, coriaceous; oblong-elliptic or ovate-oblong, apex sub-acute, base slightly cuneate or rounded, the edges slightly recurved when dry; upper surface when dry olivaceous-green, lower surface brown; the midrib and nerves depressed; the reticulations, midrib, and 8 to 14 pairs of curved spreading main-nerves very bold and prominent; length 6 to 10 in., breadth 2·5 to 4 in.; petioles ·35 in. *Cymes* 2 to 3 in. long,

covered with black pubescence, few-flowered, collected on extra-axillary or axillary tubercles, sometimes forming small panicles, consisting mostly of ♂ flowers, and often with only a few ♀, with many oblanceolate blunt bracts ·25 to ·3 in. long, and some smaller bracteoles; branches of the cyme striate when dry. *Calyx* ·15 in. long, divided to its base into 4 broadly ovate undulate lobes. *Corolla* in bud cylindric, tetragonous at the base; about ·4 in. long, tomentose, deeply divided into 4 narrowly elliptic blunt lobes. *Stamens* about 16 in 2 rows, united into a tube, the anterior row smaller than the posterior, all narrow and apiculate, the filaments short and hairy. *Female flowers* like the ♂ as to calyx, but with corolla somewhat longer and with about 12 flat staminodes. *Ovary* ovoid-conic, tomentose, attenuated into a long style. *Stigma* with several small lobes; ovary 8-celled. *Fruit* when ripe ovoid-globular, 1 to 1·25 in. in diam., glabrescent, subtended by the accrescent calyx with large reticulate undulate lobes. *Seeds* compressed, oblong. Clarke in Hook. fil. Fl. Br. Ind. III. 571. *D. frutescens*, Hassk. Pl. As. Rar. 467 (*not of* Blume).

MALACCA: *Griffith* (K.D.) 3620. PERAK: *Scortechini* 1765; *King's Collector* 8261.—DISTRIB. Java.

Specimens of this sent from Herbarium Koordersianum, Buitenzorg, have pentamerous flowers; but in other respects they do not differ from the Perak specimens in Herb. Calcutta.

24. DIOSPYROS TOPOSIOIDES, King & Gamble, n. sp. A glabrous tree 15 to 40 feet high, sometimes only a shrub; young branches rather thinner than a goose-quill, pale brown and striate when dry. *Leaves* alternate, coriaceous; oblong-elliptic, shortly acuminate or acute, base rounded; edges slightly recurved when dry; both surfaces pale olivaceous when dry, minutely but distinctly reticulate, the upper shining, the lower darker and dull; midrib channelled on the upper surface, strong and prominent on the lower; main-nerves 16 to 20 pairs, spreading, little-curved, interarching far from the edge, the intermediate nerves nearly as prominent; length 7 to 11 in.; breadth 2 to 4 in.; petiole ·3 to ·4 in. long, stout, wrinkled when dry like the midrib. *Male flowers* ·25 in. long, on pedicels longer than themselves, in cymose axillary panicles about 1 in. in length. *Calyx* coriaceous, glabrous, campanulate, with wide truncate entire or sub-entire mouth. *Corolla* slightly exceeding the calyx, ovoid, inflated below, contracted to the 4-toothed apex. *Stamens* numerous, linear, slightly auricled at the base, filaments very short. *Female flowers* when in bud ·3 in. long, conical. *Calyx* acutely 4-angled in bud; the 4 lobes deltoid, very coriaceous, puberulous outside, rusty-tomentose inside like the ovary and young

fruit, accrescent in fruit. *Corolla* slightly longer than the calyx, tubular, with 4 short erect ovate lobes, quite glabrous. *Staminodes* about 12, flattened, villous behind. *Ovary* conical, densely rusty-tomentose. *Stigma* glabrous, short, with 8 small lobes. *Fruit* in cymes, depressed-globular, 1 to 1·25 in. in diam., much exceeding the minutely reticulate calyx, glabrescent, minutely tuberculate. *Seeds* compressed.

PERAK: *King's Collector* 4106, 4361, 4889, 5769, 8242, 8357; *Scortechini*; *Ridley* 3079, 10302?

The leaves of this in texture and reticulations much resemble those of *D. Toposia*, Ham. The flowers and inflorescence are, however, different from those of that species.

25. DIOSPYROS OLEIFOLIA, Wall. Cat. 4128 (1829). A tree; young branches twice as thick as a crow-quill, almost black when dry, sparsely pubescent. *Leaves* coriaceous, alternate; narrowly oblong to elliptic, sub-acute or acute, the base cuneate; upper surface pale olivaceous, glabrous, shining; the lower yellowish, dull, for the most part glabrous, but usually with sparse adpressed black detachable hairs near the midrib and base; main-nerves invisible on either surface; midrib strong on the lower surface, slightly depressed on the upper, length 6·5 in.; breadth 2 in.; petiole ·25 in. long. *Male cymes* on axillary peduncles about ·3 in. long, each bearing 3 unequally pedicellate flowers ·5 in. long; all very dark in colour and with black hairs like those on the outer surface of the calyx. *Calyx* ·4 in. long, tubular-campanulate, densely adpressed rusty-tomentose inside, cut half-way down into 4 triangular erect lobes. *Corolla* tubular, slightly longer than the calyx, very thick, densely tomentose like the interior of the calyx; its lobes 4, very thick, oblong, spreading slightly. *Anthers* attached near the base of the tube, 16, linear-lanceolate, sessile. *Female flowers* on longer panicles than the males; pedunculate calyx with 4 triangular acute lobes, velvety outside, tawny-tomentose inside. *Fruit* depressed-globose, 1·35 in. in diam.; the pericarp woody, glabrous when ripe, tawny-tomentose when young, the persistent *calyx* at its base thick, woody, nearly 1 in. in diam., with dark tomentum outside. A. DC. Prod. VII. 132; Kurz in Journ. As. Soc. Beng. XLI., Pt. II. 72, id. XLVI., Pt. II. 235, and For. Fl. II. 132; Hiern in Trans. Camb. Phil. Soc. XII. 204; Clarke in Hook fil. Fl. Br. Ind. III. 567.

PENANG: *Curtis* 1573. PERAK: *King's Collector* 3876; *Scortechini*. —DISTRIB. Burma, Java.

26. DIOSPYROS BRACHIATA, King & Gamble, n. sp. A glabrous tree

20 to 40 feet high; young branches half as thick as a goose-quill. *Leaves* alternate, coriaceous; elliptic-oblong, acute or shortly acuminate, the base slightly cuneate or rounded; upper surface pale olivaceous when dry, lower pale brown; main-nerves 10 to 12 pairs, curved, ascending, prominent like the midrib on the lower surface, depressed somewhat on the upper; length 5·5 to 9 in.; breadth 1·5 to 2·5 in.; petioles ·3 to ·5 in. *Male flowers* about ·5 in. long. *Calyx* ·2 in. long, campanulate, divided almost to the base into 5 ovate-acute erect lobes, each folded vertically along the midrib so as to form a deep dorsal groove, everywhere minutely rusty-tomentose. *Corolla* twice as long as the calyx, narrowly tubular; the tube 5-angled, externally divided, the 5 lobes twice as long as the tube, linear-oblong, contorted in æstivation, the external half of each lobe tawny-tomentose, the inner half and the whole of the anterior surface glabrous. *Stamens* 14, linear, apiculate, sub-sessile. *Female flowers* ·4 in. long, collected in compound umbellate axillary cymes 1·5 to 1·75 in. long and about as much across, the branches compressed, rusty-puberulous, spreading, bearing a few oblong obtuse bracts; flower-pedicels varying in length from ·1 to ·2 in., bibracteolate. *Calyx* fleshy, tomentose outside, deeply divided into ovate-acuminate erect grooved lobes. *Corolla* tubular, tomentose outside, glabrous inside, very thick, deeply divided into 4 oblong lobes. *Staminodes* about 8, lanceolate, flattened. *Ovary* ovoid, tapering into a short style, tomentose. *Fruit* depressed-globose, puberulous, ·75 to ·9 in diam., and about the same from below the calyx to the somewhat concave apex; *calyx* woody, thick, 1 in. wide, with triangular deeply grooved sub-acute lobes.

PENANG: *Curtis* 1453, 1454, 10230.

27. DIOSPYROS PANICULATA, Dalz. in Hook. Kew Journ. IV. 109 (1852). A tree 50 to 70 feet high; young branches less than half as thick as a goose-quill, rusty-puberulous. *Leaves* thinly coriaceous, alternate; elliptic or elliptic-oblong, shortly and bluntly apiculate or acuminate; the base cuneate or rounded; both surfaces pale olivaceous when dry, the reticulations minute and distinct, especially on the glabrous upper surface; main-nerves 5 to 8 pairs, curving upwards and forming arches far from the edge, bold like the midrib on the lower surface and slightly depressed on the upper; lower surface softly pubescent; length 4 to 7·5 in., breadth 1·65 to 2·5 in.; petiole ·25, stout, channelled, pubescent. *Male* and *female flowers* not seen. *Fruit* in lax racemoid cymes, ellipsoid, crowned by the small remains of the style, rufous-hirsute when young, ultimately glabrous, 1·5 in. long and 1 in. in diam.; the accrescent calyx at its base with 4 large broadly ovate membranous lobes with many vertical nerves and numerous distinct

minute reticulations, each lobe 1·25 long and nearly as wide. Dalz. & Gibs. Flora Bombay, 141; Bedd. Ic. Pl. Ind. Or. t. cxxv, and Fl. Sylv. Madr. cxliv; Hiern in Trans. Camb. Phil. Soc. XII. 190; Clarke in Hook. fil. Fl. Br. Ind. III. 570.

PERAK: *King's Collector* 7637, 8163.

The scanty specimens from Perak are in fruit only, but the leaves and fruit agree so well with those of *D. paniculata*—a species hitherto known only from the west of the Indian Peninsula—that, in spite of the anomalous geographical distribution, we, temporarily at least, refer the Perak specimens to that species.

28. DIOSPYROS KUNSTLERI, King & Gamble, n. sp. A tree 20 to 40 feet high; young branches as thick as a goose-quill, glabrous. *Leaves* alternate, large, thickly membranous; elliptic to elliptic-oblong, acute, the base rounded; both surfaces, when dry, olivaceous-brown, the lower rather darker than the upper, somewhat shining, faintly reticulate; main-nerves 8 to 12 pairs, much curved, spreading, ascending, and forming wide arches ·25 in. from the edge, prominent on the lower surface like the midrib, somewhat depressed on the upper; length 8 to 12 in., breadth 3·5 to 4·5 in.; petioles ·25 to ·35 in. *Male flowers* unknown. *Female flowers* in short axillary and extra-axillary puberulous cymes, nearly 1 in. long, pedicellate; bracts narrow, nearly as long as the pedicels, oblong. *Fruit* in short stout cymes (unripe) depressed-globular, crowned by the short remains of the style, with 4 or 5 vertical ridges, everywhere densely rusty-tomentose, subtended by the accrescent almost woody calyx, with 4 deep reniform-cordate apiculate erect undulate lobes.

PERAK: *King's Collector* 4343, 7633, 8229.

29. DIOSPYROS NUTANS, King & Gamble, n. sp. A shrub or small tree 8 to 16 feet high; young branches less than one-third as thick as a goose-quill, deciduously villous, the older much thicker with deeply channelled dark-coloured, sub-glabrous bark. *Leaves* alternate, thinly coriaceous; oblong or sub-oblanceolate-oblong, apex shortly caudate-acuminate, the base rounded; both surfaces brown when dry, the upper glabrous, the lower puberulous, but often villous on the prominent midrib; main-nerves 7 to 10 pairs, curved, ascending, interarching near the margin, the reticulations distinct; length 5 to 7 in., breadth 1·5 to 2·25 in.; petiole ·15 in. *Cymes* umbellate, few-flowered, borne on the apices of slender slightly supra-axillary flexuous puberulous peduncles much longer than the leaves (often twice as long); bracteoles few, small, lanceolate, concave. *Male flowers* in different cymes from the females, ·5 in. long, on short pedicels less than ·1 in. long. *Calyx* puberulous, campanulate, with 5 long lanceolate lobes. *Corolla* four times as long

as the calyx, narrowly tubular, slightly constricted at the throat, hairy outside, glabrous inside; the limb with 5 deep oblong lobes. *Stamens* 10, linear-elliptic, apiculate, inserted in the bottom of the tube, 5 sessile and 5 with filaments. *Female flowers* shorter than the ♂, with small filamentous staminodes. *Ovary* narrowly ovoid, densely rufous-hirsute, attenuated into a long pubescent style crowned by 5 short glabrous reflexed small stigmas. *Fruit* narrowly ellipsoid, sparsely hairy, ·6 to 1 in. long and ·5 in. in diam., crowned by the persistent style and subtended by the non-accrescent calyx. *Seeds* few, narrowly ellipsoid.

PERAK: *Scortechini* 674, 1678; *King's Collector* 378, 2675, 2987, 3573, 7087.

Differs from all the other Malayan species by its long peduncled pendulous inflorescence.

SPECIES IMPERFECTLY KNOWN.

30. DIOSPYROS REFLEXA, King & Gamble, n. sp. A tree 50 to 70 feet high; young branches as thick as a goose-quill, covered with a layer of minute deciduous rusty pubescence. *Leaves* alternate, thickly coriaceous; oblong to elliptic, shortly acuminate, the base cuneate; upper surface olivaceous-brown when dry, the lower pale brown, both minutely reticulate; main-nerves 8 to 10 pairs, spreading, interarching ·15 in. from the slightly recurved edges; length 5 to 7·5 in., breadth 1·75 to 3 in.; petiole ·4 or ·5 in. *Flowers* unknown. *Fruit* hemispheric with depressed truncate apex, under 1 in. in diam.; the calyx embracing the very base of the fruit with 4 fleshy much reflexed revolute triangular fleshy lobes, densely rusty-tomentose like the fruit.

PERAK: *King's Collector* 7676, 7747.

The curious fleshy calyx with much-reflexed lobes distinguishes this from all the other Malayan species.

31. DIOSPYROS PENANGIANA, King & Gamble, n. sp. A tree 20 to 30 feet high; young branches twice as thick as a crow-quill, covered with deciduous hair of two sorts, namely, a uniform coat of minute rusty tomentum with long rusty bristle-like hairs protruding through it. *Leaves* alternate, coriaceous; oblong, shortly and bluntly acuminate, narrowed below the middle to the rather broad auriculately cordate base; upper surface when dry pale brown, shining, glabrous except the puberulous depressed midrib; lower surface reddish-brown, transversely reticulate, with pubescence like that of the young branches on the stout midrib and 10 to 14 pairs of ascending rather straight main-nerves, otherwise glabrescent; length 5·5 to 7·5 in., breadth 1·25 to 2·25 in.; petioles ·15 to ·2 in. long, hispid. *Male* and *female flowers* unknown.

Fruit sessile, globular, from ·75 to 1 in. in diam., densely covered with minute rufous tomentum, crowned by the short remains of the style and subtended by the small calyx with 5 broad reflexed lobes.

PENANG: *Curtis* 2221.

Collected only in Penang. In leaves this resembles the Bornean plant named by Hiern *Maba ? cordata*. The 5-cleft calyx of this is suggestive rather of *Diospyros* than of *Maba*.

32. DIOSPYROS RUFA, King & Gamble, n. sp. A tree 60 to 80 feet high; young branches about half as thick as a goose-quill or thicker, glabrous, brown and rough when dry. *Leaves* alternate, thickly coriaceous; oblong-elliptic, sometimes oblanceolate, the apex shortly and bluntly acuminate, the base much narrowed; upper surface warm brown when dry, glabrous, very shining; the lower dull, glabrous or slightly puberulous towards the base; main-nerves 7 to 10 pairs, spreading, little curved, interarching near the slightly incurved edges, slightly prominent on the lower surface and somewhat depressed on the upper when dry; length 5·5 to 7·5 in., breadth 1·75 to 2·25 in.; petioles ·4 to ·6 in., stout, channelled. *Male* and *female flowers* unknown. *Fruit* globular-ovoid, blunt, 1·25 to 1·5 in. long and about 1·15 in. in diam., densely rusty-tomentose. *Calyx* at base flat, 4-angled, ·4 in. in diam., rusty-tomentose.

PERAK: *King's Collector* 3330, 4945, 5409, 6712.

33. DIOSPYROS AREOLATA, King & Gamble, n. sp. A tree 50 to 60 feet high; young branches thinner than a goose-quill, rusty-puberulous becoming glabrous. *Leaves* alternate, very coriaceous; oblong, subacute, the base rounded; both surfaces glabrous except the puberulous midrib and sometimes the main-nerves, hepatic-brown when dry; the upper shining, minutely and faintly areolate; the lower dull and boldly areolar-reticulate; midrib bold on the lower surface, slightly depressed on the upper; main-nerves about 7 pairs, curved, ascending abruptly, faint on the lower surface, almost invisible on the upper; length 4·5 to 6 in.; breadth 1·5 to 1·75 in.; petioles ·5 or ·6 in. *Male flowers* (only buds seen) under ·5 in. in length, collected near the ends of the branches in tomentose cymes ·5 to 1 in. long. *Calyx* coriaceous, on a thick pedicel shorter than itself, ovoid in bud; the mouth with triangular short teeth. *Corolla* like the calyx, but glabrous and fleshy. *Stamens* about 21; anthers linear, apiculate, nearly uniform, sub-sessile or on short broad flat filaments, sometimes slightly attached in groups of 3. *Female flower* probably solitary, much broader than the ♂. *Calyx* velvety outside and inside, divided nearly to the base into 4 ovate-triangular very acute lobes ·4 in. long. *Corolla* fleshy, glabrous, ·6 in. long, its

tube wide with staminodes like the anthers of the ♂ but not so numerous; limb about as long as the tube, with 4 deep, broad, subquadrate spreading lobes. *Ovary* ovoid-conic, densely rusty-pilose. *Stigmas* 4, oblong, fleshy, glabrous. *Fruit* unknown.

PERAK: *Scortechini* 476; *King's Collector* 5813.

34. DIOSPYROS CURTISII, King & Gamble, n. sp. A tree (?); young branches rather thicker than a goose-quill, rugulose and dark-coloured when dry, glabrous. *Leaves* alternate, thinly membranous; oblong or oblong-elliptic, shortly and bluntly acuminate, base rounded or slightly cuneate; both surfaces glabrous, the upper olivaceous when dry, the lower brown; main-nerves 7 to 9 pairs, slightly curved, ascending, faint on both surfaces; the midrib prominent on the lower surface, slightly so on the upper; length 2·5 to 5 in., breadth 1·25 to 2 in.; petioles ·2 in. *Male flowers* not seen. *Female flowers* ·25 in. long, in extra-axillary or axillary fascicles of about 3 on the younger branches; pedicels about ·2 in. long, cinerous-pubescent, each with 2 oblong obtuse bracteoles at its base, about ·5 in. long. *Calyx* coriaceous, nearly ·2 in. broad at the base, deeply divided into 4 triangular-reniform glabrescent lobes. *Corolla* partially glabrous, about as long as the calyx, salver-shaped; tube short; limb divided into 4 deep, broadly ovate, spreading lobes. *Staminodes* about 4, linear-lanceolate, compressed. *Ovary* narrowly oblong, tapering into the short thick style, densely tawny-tomentose. *Fruit* unknown.

PULAU POONGAH: *Curtis* 2942.

35. DIOSPYROS GLOMERULATA, King & Gamble, n. sp. A tree 40 to 60 feet high; young branches rather thicker than a crow-quill, densely clothed with minute rufous pubescence. *Leaves* membranous, alternate; elliptic, shortly and bluntly apiculate, the base rounded or slightly cuneate; upper surface olivaceous when dry, glabrous; the lower brown, puberulous, midrib bold; main-nerves 5 or 6 pairs, slightly curved, ascending; length 2·25 to 3·5 in., breadth 1·25 to 1·75 in.; petiole about ·1 in. *Male flowers* ·2 in. long, crowded in dense sessile axillary and extra-axillary globular capitules ·4 in. across. *Calyx* sessile, campanulate, tomentose, deeply divided into 4 broadly triangular subacute erect lobes. *Corolla* tubular, tetragonous, thick, about as long as the calyx; tube glabrous, the 4 lobes pubescent outside, oblong. *Stamens* 8, separate. *Anthers* broadly lanceolate, apiculate, filaments short. *Female flowers* and *fruit* not known.

PERAK: *King's Collector* 8590.

The following description of a *Diospyros* from Pahang is taken from Ridley's account of the Flora of the Eastern Coast of the Malay Peninsula.

36. **DIOSPYROS CALIGINOSA**, Ridley in Trans. Linn. Soc. Ser. 2, III. 318 (1893). A graceful lofty tree; bark black; branches pubescent. *Leaves* alternate, elliptic-oblong, acute; 8 in. long, 3 in. broad; main-nerves 13 pairs; glabrous above, minutely pubescent beneath on the midrib and nerves; petiole ·25 in. long, minutely pubescent. *Flowers* on old wood, fascicled; peduncles short, covered with a black pubescence. *Calyx* of ♂ flower patelliform; sepals 4, broadly ovate, obtuse, covered without and on the margin with black hair. *Corolla* urceolate, white, silky, ·5 in. long; lobes 4, short, ovate, recurved. *Stamens* 16, collected in pairs; filaments thick, minutely hispid; anthers glabrous, long-conical with acute tips. *Ovary* abortive, 4-lobed, irregular, the lobes furrowed; style conical. Flowers of ♀ not seen. *Fruit* small, globose, surrounded by the accrescent sepals.

PAHANG: in thick woods at Kota Glanggi and Kwala Tembeling, *Ridley*.

We are unable, having seen no specimen, to make quite sure of the place of this species. It seems to come very near to No. 17 *D. tristis*, King & Gamble.

Order LXXIII. STYRACEÆ.

Trees or shrubs. *Leaves* alternate, simple; stipules none. *Flowers* in simple or branched axillary or terminal racemes or spikes, sometimes solitary; usually white, rarely red; bracts small, often minute or obsolete. *Calyx* gamosepalous, the tube more or less adnate to the ovary, so that it may be superior or inferior; limb 4–5-toothed or truncate, persistent. *Corolla* of 4 to 5 petals, the tube usually short, sometimes none; petals imbricate or sometimes valvate or contorted. *Stamens* adnate to the petals, equal in number to them or double or very many; 1–many-seriate; filaments free or connate; anthers round or linear, dehiscing laterally. *Ovary* inferior or superior, 2–5-celled or sometimes, by the separation of the septa, 1-celled; style filiform, sometimes thick; stigma capitate, entire or lobed; ovules 1 or more, on the inner angle of each cell, pendulous or erect. *Fruit* drupaceous, indehiscent, 1-, rarely 2–3-seeded. *Seeds* albuminous, testa thin or coriaceous, hilum generally broad; embryo straight or curved, cotyledons terete or flattened; radicle cylindrical or short.—DISTRIB. Warmer regions of Asia, Australia, and America, absent from Africa; genera 7 or 8, species about 350.

Stamens many, in several series	1. SYMPLOCOS.
Stamens 10, in one series	2. STYRAX.

1. SYMPLOCOS, Linn.

Trees or shrubs. *Leaves* alternate, often turning yellow when dry, entire or toothed. *Flowers* white, sometimes red, in axillary simple or compound spikes or racemes, sometimes in few-flowered fascicles, occasionally reduced to one flower; bracts small, solitary at the base of the pedicels; bracteoles 1 to 3, small, at the base of the flower. *Calyx-tube* adnate, short when in flower, campanulate, often enlarged in fruit; lobes 5, imbricate. *Petals* 5 in one series, or 6 to 10 in two series, free or somewhat connate, or sometimes connate in a tube, imbricate. *Stamens* adnate to the corolla, at the base of the petals or higher up the tube, numerous, many-seriate, the outer the longest; filaments filiform, or sometimes flattened; anthers short, dehiscing in longitudinal parallel cells. *Ovary* inferior, or semi-superior, 2–5-celled; style filiform; stigmas capitate, slightly lobed; ovules 2, pendulous from the inner angle of each cell. *Fruit* an oblong, ovoid or sub-globose drupe; endocarp woody or thin, often ridged or ribbed, 1–3-seeded. *Seeds* usually 1 only (by abortion); embryo terete, straight or curved, in the centre of fleshy albumen; cotyledons much shorter than the radicle.—DISTRIB. Warmer regions of Asia, Australia and America, species about 290 to 300.

- Filaments more or less pentadelphous; corolla-tube divided nearly to the base (Subg. I. HOPEA):—
  - Fruit (where known) more or less ampulliform; embryo curved (Sect. i. PALURA):—
    - Inflorescence compound, branching at any rate at the base:—
      - Branches of the inflorescence paniculately racemose, drupe nearly ·5 in. long .. .. .. 1. *S. odoratissima.*
      - Branches of the inflorescence racemose:—
        - Racemes densely ferruginous-tomentose; pedicels scarcely ·05 in. long, thick .. .. .. 2. *S. fulvosa.*
        - Racemes ferruginous-villous; pedicels ·2 in. long, slender; leaves elliptic, under 4 in. long .. 3. *S. nivea.*
        - Racemes pulverulent; pedicels ·2 in. long, slender; leaves obovate .. .. 4. *S. pulverulenta.*
        - Racemes glabrous or slightly pubescent; pedicels longer than ·05 in., slender:—
          - Leaves over 4 in. long and 2 in. broad; calyx-lobes glabrous .. .. 5. *S. monticola.*
          - Leaves under 4 in. long and 1·5 in. broad; calyx-lobes pubescent .. .. 6. *S. fasciculata.*
      - Branches of the inflorescence spicate:—
        - Leaves beneath and inflorescence glabrous or nearly so; endocarp of seed thin .. .. .. 7. *S. spicata.* var. *malasica.*
        - Leaves beneath and inflorescence ferruginous-villous; endocarp of seed hard, bony .. .. .. 8. *S. ferruginea.*

Inflorescence simple, racemose; racemes very short, almost reduced to fascicles .. .. 9. *S. Ridleyi.*

Fruit (where known) ovoid-oblong, not ampulliform; embryo straight (Sect. ii. LODHRA):—

Inflorescence paniculate, branching usually from the base only:—

Branches of the inflorescence racemose, more than ·5 in. long:—

Leaves glabrous or nearly so; fruit glabrous:—

Leaf-margins prominently broad-crenate, apex shortly and bluntly acuminate .. .. 10. *S. celastrifolia.*

Leaf-margins obscurely crenate or entire:—

Leaf-margins prominently glandular, texture almost coriaceous .. .. .. 11. *S. adenophylla.*

Leaf-margins not glandular, texture chartaceous.. 12. *S. perakensis.*

Leaves very hairy; fruit villous .. .. 13. *S. Brandiana.*

Branches of the inflorescence racemose, under ·5 in. long; leaf-margins entire or nearly so .. .. .. 14. *S. concolor.*

Inflorescence unbranched:—

Inflorescence racemose:—

Racemes 2 to 3 in. long, slender, few-flowered .. 15. *S. calycodactylos.*

Racemes very short:—

Leaves coriaceous, acute or rounded or emarginate at apex; fruit ovoid-oblong, under ·5 in. long .. 16. *S. ophirensis.*

Leaves chartaceous, long-acuminate at apex, cuneate at base; fruit cylindric-oblong, over ·5 in. long .. 17. *S. Curtisii.*

Leaves chartaceous; fruit not known:—

Leaves 6 to 7 in. long, abruptly acuminate at apex, usually sub-cordate at base, quite glabrous .. 18. *S. crassipes.*

Leaves 4 to 7 in. long, long acuminate at apex, rounded at base, ferruginous-pilose beneath .. 19. *S. penangiana.*

Inflorescence spicate:—

Drupes large, over 1 in. in length; endocarp with 8 prominent sharp ridges; leaves nearly glabrous:—

Leaves usually under 6 in. long and 2 in. broad; young inflorescence without prominent bracts .. 20. *S. cerasifolia.*

Leaves usually over 6 in. long and 2 in. broad; young inflorescence prominently bracteate so as to appear strobilate .. .. 21. *S. rigida.*

Drupes small, under ·5 in. long; endocarp with faint ridges only; leaves rusty-pubescent beneath; young inflorescence strobilate .. .. .. 22. *S. rubiginosa.*

Filaments connate in a staminal tube; corolla-tube elongate (Subg. II. CORDYLOBLASTE):—

Corolla-tube scarcely ·3 in. long .. .. .. 23. *S. confusa.*

Corolla-tube about 1 in. long:—

Inflorescence densely rusty-tomentose; leaves pubescent beneath .. .. 24. *S. Maingayi.*

Inflorescence slightly grey-pubescent; leaves glabrous .. 25. *S. Scortechinii.*

Subgenus I.—HOPEA.

1. SYMPLOCOS ODORATISSIMA, Choisy ex Zoll. Syst. Verz. 136 (1854). A tree with spreading branches reaching 60 to 70 feet in height and 18 to 24 in. in diam. of stem; branches grey, stout; branchlets dark greyish-brown, angled, striate, minutely puberulous; leaf-buds acuminate, ·15 in. long. *Leaves* thinly coriaceous; elliptic or elliptic-obovate or elliptic-oblong, shortly acuminate at apex, cuneate or slightly rounded at base; glabrous on both surfaces; margin entire or serrate, blackish-brown when dry; 3 to 6 in. long, 2 to 2·5 in. broad; midrib slender, prominent beneath, impressed above; main-nerves 8 to 10 pairs, arching upwards to and along the margin where they meet in an intramarginal looped nerve near it; reticulations transverse, not prominent; petiole ·4 to ·6 in. long, flattened above. *Inflorescence* of grey-pubescent panicles, 1·5 to 2 in. long, axillary to the upper leaves, longer in fruit and stouter; branches paniculately racemose; bracts very small, deciduous; bracteoles 2, below the calyx-tube, ovate-acute, reflexed, ·05 in. long; pedicels ·15 in. long. *Calyx-tube* ·05 in. long, pubescent; lobes 5, as long as tube, rounded. *Corolla-tube* very short; lobes ovate-obtuse, ·15 in. long, pubescent on back, ciliate, white. *Stamens* in 5 bundles opposite corolla-lobes, very many, 80 to 100 in all; filaments slender; anthers rounded. *Ovary* villous; style thick, ·075 in. long, stigma lobed; cells 3, ovules 2 in each cell. *Fruit* an ampulliform drupe, ·4 to ·5 in. long, ·25 in. broad, lower part rounded, upper cylindrical, crowned by the calyx-rim and connivent lobes, the calyx-rim ·075 in. broad; exocarp corky, rusty-brown, slightly pubescent; endocarp hard. *Seeds* 1 to 3, usually 1 only perfect; testa membranous, albumen fleshy; embryo slightly curved, ·15 in. long, radicle long. Miq. Fl. Ind. Bat. I. Pt. 2, 468; Koord. & Val. Bijdr. VII. 148; Brand Monog. Sympl. 35. *Dicalyx odoratissimus*, Blume Bijdr. 1116.

PERAK: *King's Collector* 10030, 10411, 10777. SINGAPORE: *Ridley* 4428 (this latter specimen has leaves up to 8 in. long and 3·5 in. broad).—DISTRIB. Sumatra (*Beccari* 834), Java, Borneo (*Beccari* 4014).

This is var. *divaricata*, Brand, which seems to us hardly separable, unless by the leaves being almost entire. In the Java and Sumatra specimens of *G. odoratissima* the leaves are markedly serrate.

2. SYMPLOCOS FULVOSA, King & Gamble, n. sp. A very large tree, reaching 150 feet in height (Scortechini); branchlets dark-brown, young ones and innovations densely ferruginous-tomentose. *Leaves* chartaceo-coriaceous; elliptic, abruptly long blunt-acuminate at apex the acumen often curved, cuneate or attenuate at base; glabrous and shining above,

glabrous and dull beneath, ferruginous-brown when dry; margins faintly crenate-serrate, with a row of glands, slightly recurved; 3 to 4·5 in. long, 1·25 to 2 in. broad; midrib slender, slightly impressed above; main-nerves 6 to 8 pairs, the lowest pair close to the margin, the rest gradually more distant upwards, curved upwards to and along the margin where they meet in a looped intramarginal nerve; reticulations many, forming an elegant network; petiole ·75 in. long. *Inflorescence* of tripartite sessile panicles of racemes, the racemes 1 to 2 in. long, densely ferruginous-tomentose; bracts and bracteoles minute, hidden in the tomentum; pedicels thick, ·05 in. long; flowers white, then yellowish. *Calyx-tube* short; lobes very short, rounded, densely tomentose without. *Corolla-tube* short; lobes ovate-oblong, glabrous, ·15 in. long, 3–5-nerved. *Stamens* many, obscurely separated in bundles; filaments slender; anthers very small rounded. *Ovary* and disk glabrous, style glabrous, ·075 in. long, stigma capitate; cells 3. *Fruit* unknown.

PERAK: *Scortechini* 563, 567.

3. SYMPLOCOS NIVEA, Brand Monog. Sympl. 36 (1901). A tree, reaching 50 to 60 feet in height; branchlets slender, rounded, dark brown, glabrous; leaf-buds ovate-acuminate, tawny-pubescent. *Leaves* chartaceo-coriaceous; elliptic or elliptic-oblong, acute or acuminate at apex, cuneate at base; glabrous and shining above, glabrous and pale beneath, dark olive-brown when dry; margins obscurely undulate-crenate, recurved; 3 to 4 in. long, 1 to 1·75 in. broad; midrib slender, impressed above; main-nerves 5 to 6 pairs, irregularly spaced and often branched, at first straight then curved upwards to and along the margin where they anastomose in a looped intramarginal nerve; reticulations obscure; petiole slender, ·3 to ·4 in. long. *Inflorescence* an axillary panicle of villous racemes 2 to 3 in. long, the racemes 12–15-flowered; bracts and bracteoles ovate-lanceolate, villous, quickly caducous; pedicels slender, ·2 in. long. *Calyx-tube* adnate to the ovary; lobes 5, oblong-obtuse, ·1 in. long, glabrous, persistent. *Corolla* pure white; lobes twice as long as those of the calyx. *Stamens* about 60, as long as the corolla. *Ovary* glabrous, 1-celled, ovules apparently 2; style slender from a conical villous base. *Fruit* unknown.

PENANG: at Pulau Boetong, Government Hill and Muka Head, *Curtis* 715.

4. SYMPLOCOS PULVERULENTA, King & Gamble, n. sp. A tree (?); ultimate branchlets and inflorescence grey- or golden-pulverulent-scaly; leaf-buds lanceolate-acuminate. *Leaves* membranous; obovate, abruptly short-acuminate at apex, cuneate often unequally at base; glabrous on both surfaces except on the nerves, olive-green when dry; margins

entire; 5 to 7 in. long, 2 to 3 in. broad; midrib slender, impressed above; main-nerves 8 to 9 pairs, curving upwards to and along the margin; reticulations transverse, prominent and slightly raised above; petiole ·7 to ·8 in. long, smooth, pulverulent-pubescent. *Inflorescence* of axillary panicles of racemes about 2 in. long; main rachis ·7 in. long; branches sub-opposite, about 2 pairs, ·5 to 1 in. long; bracts short, ovate, caducous; bracteoles 2, ovate-acute, under the calyx-tube; pedicels slender, ·15 to 2 in. long; flowers yellow, buds globose. *Calyx-tube* funnel-shaped, ·06 in. long; lobes 5, short, rounded. *Corolla-tube* short; lobes 5, ovate, obtuse, pulverulent-pubescent. *Stamens* very numerous, probably 200 at least, in 5 bundles opposite the corolla-lobes; filaments slender; anthers very small, rounded. *Ovary* and disk pubescent; style stout, stigma capitate; cells 2, ovules several. *Fruit* not known.

SINGAPORE: at Chanchukam, *Ridley* 4786.

5. SYMPLOCOS MONTICOLA, King & Gamble, n. sp. A shrub or small tree reaching 20 feet in height and 3 in. in diam. of stem; branchlets somewhat slender, pale brown, sinuous; leaf-buds small, acuminate. *Leaves* chartaceous; elliptic or elliptic-oblong, acuminate at apex, cuneate or somewhat rounded at base; glabrous on both surfaces, greenish-brown when dry; margins serrate except near the base, slightly recurved; 4 to 6 in. long, 2 to 2·5 in. broad; midrib slender, pale, impressed above; main-nerves 6 to 8 pairs, close near the base, gradually more distant, curved upwards to meet in a looped intramarginal nerve; secondary nerves few, reticulations transverse; petiole ·25 in. long, channelled above. *Inflorescence* a fascicle of racemes either from the axils of leaves a little below the last, or from the new wood below them; racemes ·5 to 1·5 in. long, 6–8-flowered, all parts nearly glabrous; bracts ovate, very minute; pedicels 0 to ·1 in. long; bracteoles 2, ovate, acute, ciliate, ·05 in. long, at the base of the calyx-tube. *Calyx-tube* short; lobes as long (·1 in.), thin, glabrous, round. *Corolla-tube* very short; lobes 5, thin, oblong, obtuse, ·2 in. long, 3-nerved. *Stamens* many, more than 80, in 5 bundles opposite the corolla-lobes; filaments slender; anthers rounded. *Ovary* and disk glabrous or slightly pubescent; style short, ·1 in. long; stigma capitate; cells 3. *Fruit* not known.

PERAK: *Scortechini* 533; *King's Collector* 3804, 6927, in dense jungle on the summits of mountains at 4,000 to 4,600 feet.

6. SYMPLOCOS FASCICULATA, Zoll. Syst. Verz. 136 (1854). A tree with spreading branches reaching 40 to 50 feet in height and 10 to 15 in. in diam. of stem; branchlets pale greyish-brown, slender, innovations greyish-pubescent. *Leaves* thinly chartaceous or membranous; oblong-lanceolate, long acuminate at apex, the acumen curved and mucro-

nate, rounded or obtusely rhomboid at base; glabrous and shining above, glabrous beneath except on the midrib, yellowish when dry; margins entire or obscurely and distantly serrate, slightly recurved; 2 to 4 in. long, ·7 to 1·5 in. broad; midrib slender, impressed above, minutely pilose beneath; main-nerves about 5 to 7 pairs, indistinct, curved upwards and meeting in an intramarginal looped nerve rather distant from the margin; secondary nerves and reticulations slender, obscure; petiole ·2 in. long, bordered above by the decurrent margin of the blade and minutely pilose. *Inflorescence* a short fascicle of axillary cymes or racemes ·5 to ·7 in. long, ashy-pubescent; bracts very minute; pedicels slender, ·15 in. long; bracteoles 3, minute, ovate, acute, ciliate. *Calyx-lobes* 5, rounded, obtuse, ·05 in. long, pubescent without. *Corolla-lobes* oblong, obtuse, ·1 to ·15 in. long, glabrous, 5-nerved; tube very short or almost none. *Stamens* in 5 bundles opposite the corolla-lobes, about 20 to 25 or sometimes more; filaments slender, outer ones exsert; anthers minute, rounded, emarginate. *Ovary* depressed at top, disk glabrous, cells 3; style slender, ·075 in. long, ending in a flattened 3-lobed stigma. *Fruit* an ampulliform drupe, ovoid below for ·2 in. in length, ·15 in. in diam., glabrous, 5–6-ribbed, tipped by a cylindric beak ·05 in. long and by the persistent calyx-lobes; exocarp thin, endocarp hard, furrowed, furnished within with 3 to 6 strong ribs, enclosing a much-lobed seed; testa thin; albumen fleshy; embryo very slightly curved, ·15 in. long. Miq. Fl. Ind. Bat. I. Pt. 2. 467; Clarke in Hook. f. Fl. Br. Ind. III. 574; Koord. & Val. Bijdr. 7. 150; Brand Monog. Sympl. 34. *Dicalyx tinctorius*, Bl. Bijdr. 1116.

PENANG: *Curtis* 3171. PERAK: *Wray* 1865, 2418, 2466, 2739, 3561; *Scortechini* 128, 1527; *King's Collector* 1042, 2021, 3003, 4739, 5175, 5337, 10525. SELANGOR: *Ridley* 8209. MALACCA: *Maingay* (K.D.) 958; *Griffith* (K.D.) 3665; *Holmberg* 867. JOHORE: *G. King*. SINGAPORE: *Murton* 143; *Ridley* 3626A, 8209.—DISTRIB. Sumatra (*Forbes* 2355, 2358, 2563, 2812); Java (*Forbes* 218); Borneo (*Beccari* 2380; *Haviland* 1024, 1545).

After a great deal of trouble the seed with albumen and embryo were separated. The walls of the shell of the fruit are furnished inside with projecting ribs, so that the seed resembles that of a small walnut and the embryo is slightly curved, long and narrow, and might be called straight. Koorders & Valeton's description is thus confirmed.

7. SYMPLOCOS SPICATA, Roxb. Hort. Beng. 40 (1814), and Fl. Ind. II. 541; Wall. Cat. 4417; A.DC. Prod. VIII. 254; Wight Ill. t. 150; Miq. Fl. Ind. Bat. I. Pt. 2. 465; Bedd. Fl. Sylv. Madr. cxlix; Brandis For. Fl. 300; Kurz in Journ. As. Soc. Beng. XLVI. ii. 239 and For. Fl. II. 146; Clarke in Hook. f. Fl. Br. Ind. III. 573; Trimen Fl. Ceyl. III. 104;

Cooke Fl. Bomb. II. 108; Koord. & Val. Bijdr. VII. 144. *S. polycarpa*, Wall. Cat. 4423; DC. l.c. 255; Kurz ll.c. *S. Loha*, Don Prod. 144; DC. l.c. 255. *S. racemosa*, Wall. Cat. 4418 (*in part, not of* Roxb).

VAR. *malasica*, Clarke in Hook. f. Fl. Br. Ind. III. 573. A small tree with spreading branches, reaching 30 to 40 feet in height and 1 foot in diam. of stem; branchlets dark grey-brown, smooth, innovations glabrous; buds lanceolate acuminate. *Leaves* coriaceo-chartaceous, alternate; elliptic- or oblong-lanceolate, acute or acuminate at apex, cuneate at base; entire or serrate, glabrous on both surfaces, turning yellow when dry; margin distantly and slightly denticulate, glandular; 4 to 7 in. long, 1·5 to 2·5 in. broad; midrib thick, impressed above; main-nerves about 10 pairs, irregular, curved upwards and branching towards the margin; secondary nerves few; reticulations prominent on the under surface; petiole ·4 to ·7 in. long, channelled above. *Inflorescence* an axillary panicle of spikes, the branches mostly near the base; spikes 1·5 to 4 in. long, glabrous or slightly pubescent; bracts very small, deciduous; bracteoles under each flower 3, ovate, acute or obtuse, ciliate, ·05 in. long. *Calyx-lobes* 5, rounded, imbricate, glabrous, tube as long as lobes, the latter ·05 in. long. *Corolla* 5-lobed, white or yellowish; tube very short; lobes ovate-orbicular, ·1 to ·15 in. long. *Stamens* indefinite, about 40, the outer ones longer than the petals, inserted on the corolla-tube; filaments slender; anthers short, rounded. *Ovary* inferior, 3-celled; ovules 3 to 4 in each cell; style thick, ·1 in. long, stigma capitate. *Fruit* a globose drupe ·15 to ·2 in. long, surmounted by a rim formed by the short calyx-lobes, smooth, olive-coloured, exocarp and endocarp thin, ribbed. *Seed* 1, testa thin, albumen rather scanty; embryo curved.

PERAK: *Wray* 2798; *Scortechini; King's Collector* 6299, 6903. MALACCA: *Griffith; Maingay* (K.D.) 957; *Derry* 506.

VAR. *acuminata*, Brand Monog. Sympl. 40. *Leaves* long acuminate, blunt at the tip, serrulate, 3 to 5 in. long, 1 to 2 in. broad; main-nerves 7 to 8 pairs, all nerves and reticulations, except the impressed midrib, prominent on the upper surface in young leaves. *Flowers* sometimes pedicellate. *Fruit* somewhat urceolate, ribbed. *Symplocos acuminata*, Miq. Fl. Ind. Bat. I. Pt. 2. 467. *Dicalyx acuminatus*, Bl. Bijdr. 1119.

PERAK: *Scortechini* 1556. — DISTRIB. Java, Sumatra (*Forbes* 3208).

VAR. *attenuata*, Clarke in Hook. f. Fl. Br. Ind. III. 573. *Leaves* long acuminate at apex, long attenuate at base, 3 to 4 in. long, 1 to 1·25 in. broad; margins serrate. Spicate branches of the inflorescence slender, usually short. *Fruit* small, often only ·1 to ·15 in. in diam.

S. attenuata, Wall. Cat. 4426; A. DC. Prod. VIII. 256; Brand Monog. Sympl. 39.

KEDAH: *King's Collector* 1764.—DISTRIB. Assam, Burma.

8. SYMPLOCOS FERRUGINEA, Roxb. Hort. Beng. 40 (1814), Fl. Ind. II. 542. A tree with spreading branches reaching 50 to 60 feet in height and 1 foot in diam. of stem; branchlets stout, dark brown, smooth, innovations densely ferruginous-villous. *Leaves* coriaceous; elliptic or elliptic-lanceolate, acuminate at apex, cuneate at base; glabrous and shining above, ferruginous-villous especially on the nerves beneath, turning yellow when dry; margins serrulate, denticulate or almost entire, recurved; 5 to 8 in. long, 1·5 to 3 in. broad; midrib stout, very prominent beneath, impressed above; main-nerves 12 to 14 pairs, prominent beneath, parallel at first and straight for some distance then arching near the margin; secondary nerves few; reticulations obliquely transverse, not prominent; petiole ·3 to ·5 in. long, densely rusty-villous, thick. *Inflorescence* an axillary panicle of spikes, 2 to 6 in. long, the spikes and panicle short in bud, longer in flower, much elongated in fruit, the branches of the panicle mostly near the base, densely ferruginous-villous; bracts very small, ovate-acute, villous; bracteoles under each flower 3, the central one ·12 in. long, ovate-acuminate, the two outer shorter, ovate-acute, the three together as long as the calyx. *Calyx* 5-lobed; lobes ovate-obtuse, ·1 in. long, pubescent without. *Corolla* 5-lobed, white, rotate; tube ·05 in. long; lobes ·1 in. long, oblong-obtuse, 3-nerved. *Stamens* indefinite, 40 to 70, in 5 fascicles inserted on the corolla-tube; filaments slender, gradually increasing in length from the inside outwards, the outer ones a little longer than the petals; anthers rounded, short. *Ovary* depressed, disk glabrous; cells 3; style thick, ·1 to ·2 in. long, stigma 3-lobed; ovules several in each cell. *Fruit* a globose or ampulliform drupe, faintly ribbed, ·15 to ·2 in. long, surmounted by the persistent calyx with enlarged connivent teeth; exocarp thin; endocarp very hard, bony, about 12–14-ribbed, globose below, cylindric and very short above. *Seed* 1, testa thin, albumen rather scanty; embryo curved, ·1 to ·15 in. long. Wall. Cat. 4412; A. DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I. Pt. 2. 466; Clarke in Hook. f. Fl. Br. Ind. III. 574 (*var. exc.*); Koord. & Val. Bijdr. VII. 141; Brand Monog. Sympl. 40. *S. mollis*, Wall. Cat. 4433; G. Don Gen. Syst. IV. 3. *S. Verhuellii*, Jungh. & de Vriese Pl. Nov. Ind. Or. 12; Miq. l.c. 467. *S. javanica*, Kurz in Journ. As. Soc. Beng. XLVI. ii. 239 (*syn. S. rubiginosa* exc.) and For. Fl. II. 145. *S. lachnobotrya*, and *S. Horsfieldiana*, Miq. Fl. Ind. Bat. Suppl. 475. *Dicalyx javanicus*, Blume Bijdr. 1117.

PENANG: *Wallich* 4433; *Phillips*; *Curtis* 206; *King's Collector*

1353. PERAK: *Wray* 3387; *Scortechini* 900; *King's Collector* 925, 4376, 4395, 4683, 5235, 6219, 7091, 8646, 11019. PAHANG: *Ridley* in Trans. Linn. Soc. Ser. 2, III. 318. MALACCA: *Maingay* (K.D.) 956.—DISTRIB. Assam, Burma, Java (*Forbes* 682, 798, 861, 1203), Sumatra (*Forbes* 2614, 2691, 3150; *Beccari* 842), the Moluccas, the Philippines, and S. China.

The leaves in this species are very variable; for instance, those of *King's Collector* Nos. 4395, 4683 have oblong-lanceolate leaves 6 to 8 in. long and about 2 in. broad, with more distant nerves, and are nearly glabrous beneath; but some of the leaves approach very nearly to those of other specimens, and we cannot therefore separate it as a variety. The marked elongation of the fruiting inflorescence is another source of difficulty in superficial identification.

9. SYMPLOCOS RIDLEYI, King & Gamble, n. sp. A medium-sized tree; branchlets glabrous, angled, striate; leaf-buds acuminate, glabrous. *Leaves* coriaceous; ovate or oblong, acuminate at apex, attenuate at base; glabrous on both surfaces, shining above, greenish-yellow when dry; margins entire or remotely and faintly denticulate, recurved; 3 to 4 in. long, 1 to 1·5 in. broad; midrib slender, raised above; main-nerves 8 to 9 pairs, raised on both surfaces, straight, meeting in a looped intramarginal nerve; secondary nerves few; reticulations prominent, raised above; petiole ·3 in. long, channelled above. *Inflorescence* of sessile or very short few-flowered axillary racemes, as long as the petiole; rachis silky-pubescent; bracts and bracteoles orbicular, ciliate, pubescent; pedicels none or very short. *Calyx-lobes* orbicular, thin, ciliate, ·1 in. broad, concave; tube very short. *Corolla-tube* very short, lobes ovate, ·12 to ·15 in. long, 3–5-nerved, white. *Stamens* about 50, in bundles opposite the corolla-lobes; filaments slender, the outer ones a little longer than the corolla-lobes: anthers rounded. *Ovary* villous, 3-celled, ovules 2 in each cell; disk glabrous; style thick, ·1 in. long, stigma capitate, lobed. *Fruit* not known.

SINGAPORE: *Ridley* 5684.

A species very closely allied to *S. phyllocalyx*, Clarke, of N. India and China, and to *S. japonica*, A. DC. of Japan.

10. SYMPLOCOS CELASTRIFOLIA, Griff. MS.; Clarke in Hook. f. Fl. Br. Ind. III. 575 (1882). A tree (?); branchlets smooth, slender, glabrous. *Leaves* chartaceous; elliptic or elliptic-oblong, shortly and bluntly acuminate at apex, cuneate at base; glabrous on both surfaces, greenish-brown above, yellowish beneath when dry; margins crenate, slightly recurved; 2·5 to 5 in. long, 1·5 to 2·25 in. broad; midrib slender, impressed above; main-nerves 6 to 8 pairs, irregular, not prominent, at first straight, then curving upwards and branching to meet

near the margin in an intramarginal network; reticulations obscure; petiole ·2 to ·3 in. long, bordered by the decurrent margins of the blade. *Inflorescence* a few- and basally-branched pubescent panicle of long slender racemes, 2·5 to 3 in. long; racemes 12–16-flowered; pedicels ·1 in. long; bracteoles 2, lanceolate, ·05 in. long, ciliate, pubescent. *Calyx*-tube ·05 in. long; lobes 5, oblong, obtuse, ·075 in. long. *Corolla* white, sweet-scented; tube very short; lobes ovate-oblong, ·2 in. long. *Stamens* in 5 bundles opposite the corolla-lobes, 40 to 70, the outermost the longest and equal to the corolla-lobes. *Ovary* depressed, disk glabrous; cells 3; style ·125 in. long, stigma capitate. *Fruit* an ovoid-ellipsoid drupe, ·25 in. long, smooth, tipped with the rim and erect teeth of the persistent calyx. *Seeds* 1 to 3, testa membranous; embryo slender, straight, ·1 in. long. Brand Monog. Sympl. 48.

PENANG: *Curtis* 3459. MALACCA: *Griffith* (K.D.) 3651.—DISTRIB. Borneo (*Teysmann*, *Motley*, *Beccari* 2374, *Haviland* 509B, 1642, 3706).

11. SYMPLOCOS ADENOPHYLLA, Wall. Cat. 4427 (1829). A tree reaching 50 to 60 feet in height, stem 15 to 20 in. in diam.; branchlets dark brown, smooth, upper parts and innovations dark rusty-glandular-pubescent. *Leaves* chartaceo-coriaceous; narrowly lanceolate to elliptic-lanceolate and elliptic; obtusely long caudate-acuminate at apex, cuneate or attenuate at base; glabrous on both surfaces, shining or not, olive-brown or dark reddish-brown when dry; margins crenate or subentire, the crenatures with large glands, sometimes recurved; 3 to 5 in. long, ·7 to 1·5 in. broad; midrib slender, impressed above; main-nerves 5 to 8 pairs, distant, arching upwards to join in a looped intramarginal nerve at about two-thirds of the distance to the margin; secondary nerves and reticulations obscure; petiole ·3 to ·5 in. long, often bent. *Inflorescence* a 3- and basally-branched axillary panicle of racemes, glandular-rusty-pubescent, 1 to 2 in. long, racemes about 12-flowered; bracts ovate-acute, caducous; pedicels ·05 to ·1 in. long; bracteoles minute, thin, obtuse. *Calyx-tube* glabrous or minutely pubescent, ·05 in. long; its teeth very minute, triangular or rounded, rusty-pubescent. *Corolla* yellowish-white, tube short; lobes oblong, rounded, about ·15 in. long, incurved at tip. *Stamens* 40 to 50, in 5 bundles opposite the corolla-lobes, outer ones as long as those lobes; filaments slender; anthers small, rounded. *Ovary* depressed, disk glabrous, cells 3; style slender, ·1 in. long; stigma capitate. *Fruit* an oblong-cylindrical or ellipsoid drupe ·3 to ·35 in. long and half as broad, smooth, pale yellowish-brown, crowned with the minute, inconspicuous, much-incurved, persistent calyx-teeth; exocarp smooth, thin; endocarp bony, ribbed. *Seed* 1; embryo straight, pendulous. G. Don Gen. Syst. IV. 3; A. DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I. Pt. 2, 466;

Clarke in Hook. f. Fl. Br. Ind. III. 575; Brand Monog. Sympl. 48; Stapf in Trans. Linn. Soc. 2nd Ser. IV. 204. *S. iteophylla*, Miq. Fl. Ind. Bat. Suppl. 476; Brand l.c. *S. bancana*, Miq. l.c.

KEDAH: *Ridley* 5533. PENANG: *Wallich* 4427A; *Maingay* (K.D.) 959; *Curtis* 402, 445. PERAK: *Wray* 1119, 3842, 3925, 4123; *Scortechini* 490; *King's Collector* 1269, 2606, 6873. SELANGOR: *Ridley* 7553, 8549. MALACCA: *Griffith* (K.D.) 3649. SINGAPORE: *Wallich* 4427B; *G. Thomson*; *Hullett* 828; *Walker* 255; *Ridley* 3635A, 3809.—DISTRIB. Sumatra (*Beccari* 147); Bangka (*Horsfield* 39); Borneo (*Beccari* 2115, *Lobb*, *Haviland* 1187).

A variable species as regards the leaves and the length of the inflorescence; the prominent glands on the margins of the leaves are a noticeable character.

12. **SYMPLOCOS PERAKENSIS**, King & Gamble, n. sp. A tree with spreading branches reaching 50 to 60 feet in height; stem 15 to 20 in. in diam; branchlets dark brown, very slender. *Leaves* chartaceous; elliptic, long caudate-acuminate at apex, cuneate at base; glabrous on both surfaces, green when dry; margins entire, recurved; 2 to 3·5 in. long, 1 to 1·5 in. broad; midrib slender; main-nerves 6 to 7 pairs, the two lowest near the margin and produced upwards along it, the others curved upwards to meet in a looped intramarginal nerve, which is rather prominent; secondary nerves and reticulations obscure; petiole ·2 in. long, channelled above. *Inflorescence* a sessile 3-branched panicle of racemes axillary to the upper leaves or on the branchlets below them, 1 to 2 in. long or less; panicle branches and racemes very slender, the latter about 8–10-flowered; rachis grey-pubescent; 1 bract and 2 bracteoles, ovate-acute, scarcely ·05 in. long, persistent; pedicels about ·05 in. long. *Calyx-tube* short; lobes 5, rounded, grey-pubescent, ciliate, ·05 in. long, as long as tube. *Corolla-tube* short; lobes oblong, white, ·125 in. long. *Stamens* about 40, in 5 bundles opposite the corolla-lobes; filaments slender, exsert; anthers rounded, minute. *Ovary* villous; cells 3; style rather thick, villous, ·1 in. long, stigma small. *Fruit* a cylindrical glabrous drupe, ·4 to ·5 in. long, ·25 in. in diam., the top rusty-hirsute and crowned by the persistent rusty-hirsute calyx-lobes, the calyx-rim ·1 in. broad; exocarp fleshy, endocarp hard, bony. *Seeds* 3, testa rather thick, embryo straight.

PERAK: *Scortechini* 646; *Wray* 2593, 2944; *King's Collector* 4446, 4570, 4586, 7863, 10163, 10501, 10515, 10801, 10985. SELANGOR: *Ridley* 10223.

This species is very near to *S. adenophylla*, but the leaves are entire, much thinner and smaller, and not glandular, and the inflorescence is more compound, more slender, grey- and not rusty-pubescent, and has rounded calyx-lobes.

13. SYMPLOCOS BRANDIANA, King & Gamble, n. sp. A small tree reaching 15 to 25 feet in height; stem 4 to 6 in. in diam.; branchlets round, densely covered with soft ferruginous tomentum and long stiff hispid hairs; innovations densely ferruginous-silky-tomentose. *Leaves* membranous; ovate-oblong, long acuminate at apex, rounded or cordate at base; pilose on both surfaces, at length glabrescent above, paler beneath, olive-brown when dry; margin entire, recurved, thickly villous; 3 to 6 in. long, 1 to 2 in. broad; midrib slender, prominent beneath; main-nerves about 8 pairs, much curving upwards to join as a looped intra-marginal nerve, raised beneath; reticulations obscure; petiole scarcely ·1 in. long. *Inflorescence* of axillary few-flowered racemes or panicles up to 1·5 in. long, lax-flowered; rachis slender, thickly ferruginous-villous, as are the bracts and calyx; bracts leaf-like, cuspidate-acuminate, ·2 to ·4 in. long; bracteoles 2, similar but smaller; pedicels ·1 in. long; flowers white. *Calyx-tube* very short; lobes linear-lanceolate, ·1 to ·2 in. long. *Corolla-tube* very short; lobes elliptic-obtuse, glabrous, 3-nerved, ·15 in. long. *Stamens* 60 to 70 or even more, in 5 bundles opposite the corolla-lobes; filaments slender; anthers small, rounded. *Ovary* and disk villous, style slender, stigma capitate. *Fruit* oblong-cylindrical, light blue, constricted above the middle, villous, ·8 in. long, ·3 in. broad; exocarp fleshy, endocarp crustaceous; cells 3, the lower one bearing 1 seed; albumen fleshy; embryo slightly curved.

PERAK: *Curtis* 2030; *Scortechini* 346, 349 on Maxwell's Hill, 3,000 feet; *Wray* 677 at Waterfall Hill, Larút; *King's Collector* 1887, in dense jungle on rocky creeks.

We have named this handsome species in honour of the author of the most recent monograph of the genus.

14. SYMPLOCOS CONCOLOR, Brand Monog. Sympl. 65 (1901). A tree, reaching 30 to 40 feet in height; branchlets dark brown, innovations tawny-pubescent. *Leaves* thinly coriaceous; oblong or oblong-obovate, abruptly acuminate at apex, the acumen mucronate, attenuate at base; glabrous on both surfaces, shining above; margins entire or obscurely dentate; 3 to 4 in. long, 1–1·5 in. broad; midrib slender, slightly raised above; main-nerves 6 to 7 pairs, rather obscure, arching upwards to anastomose near the margin; reticulations prominent; petiole about ·1 in. long. *Inflorescence* of sessile or very shortly peduncled, 3-branched panicles up to ·5 in. long, all golden-pubescent, about 10–12-flowered; bracts ovate-acute, small; bracteoles smaller, 2 to each pedicel; pedicels slender, about ·1 in. long. *Calyx-tube* funnel-shaped, ·05 in. long; lobes 5, rounded, short. *Corolla-tube* very short; lobes oblong, ·1 in.

long. *Stamens* about 60, scarcely exsert. *Ovary* and disk silky-pubescent; style slender, stigma capitate, 3–4-lobed. *Fruit* an oblong glabrous drupe, ·3 in. long, ·15 to ·2 in. broad, surmounted by the slightly depressed disk which is shortly overtopped by the calyx-lobes.

PENANG: on Penam Bukit at 2,000 feet, *Curtis* 1039.

15. SYMPLOCOS CALYCODACTYLOS, Brand Monog. Sympl. 63 (1901). A tree (?); branchlets villous with long tawny spreading bristles, innovations densely villous. *Leaves* membranous; oblong-lanceolate, long-acuminate at apex, rounded at base, sometimes almost cordate; both surfaces covered sparsely with tawny bristles, especially on and along the nerves beneath; margins distantly long glandular denticulate; 4 to 5·5 in. long, 1·5 to 2 in. broad; midrib slender, impressed above; main-nerves about 8 pairs, curving slightly upwards at an angle of about 30° with the midrib to anastomose near the margin; reticulations prominent, primary ones transverse parallel; petiole stout, villous, ·15 to ·2 in. long. *Inflorescence* a slender, axillary, tawny-villous raceme, 2 to 3 in. long, with about 4 to 5 flowers; bracts lanceolate-acuminate, ·25 in. long, caducous; pedicels ·5 in., very slender, ending in a dense tuft of tawny bristles beneath the calyx. *Calyx-tube* short; lobes 5, linear oblong, densely tawny-bristly without, glabrous within, ·25 in. long. *Corolla-tube* short; lobes 5, obovate, glabrous, as long as calyx-lobes or slightly longer. *Stamens* about 80, 5-adelphous, filaments flattened; anthers small, rounded. *Ovary* and disk villous; style slender, ·1 in. long; stigma small, capitate. *Fruit* unknown.

PERAK: at Waterloo, 3,000 feet, *Curtis* 1330.

16. SYMPLOCOS OPHIRENSIS, Clarke in Hook. f. Fl. Br. Ind. III. 479 (1882). A bush (Wray), or more probably a small tree; branches terete, nearly black, glabrous; innovations appressed-tawny-pubescent; buds ovate-acuminate, silky, ·1 in. long. *Leaves* coriaceous; elliptic or elliptic-lanceolate, acute or rounded or sometimes emarginate at apex, cuneate or rounded at base; glabrous and usually shining above, sparsely pubescent beneath when young, afterwards glabrous, reddish-brown when dry; margins entire or very obscurely denticulate, recurved; 2 to 4 in. long, 1 to 1·5 in. broad; midrib stout, impressed above; main-nerves 8 to 10 pairs, raised on both surfaces, straight at first, then curving upwards and joining in an intramarginal looped nerve; secondary nerves many, similar, reticulations prominent; petiole stout, ·1 to ·2 in. long. *Inflorescence* of very short racemes, from the axils of the upper leaves or from the new wood below them; racemes ·3 to ·4 in. long, silky-pubescent, 5–7-flowered; bracts and bracteoles very small, ovate, acute; pedicels 0 to ·1 in. long. *Calyx-lobes* 5, silky-pubescent, ovate-acute, ciliate, ·6 in. long; tube ·1 in. long. *Corolla-tube* short; lobes

white, oblong-obtuse, ·2 in. long, 5-nerved. *Stamens* in bundles of 6 to 12 each opposite the corolla-lobes, 30 to 60 in all; filaments slender, outer as long as petals; anthers rounded, very small. *Ovary* and disk nearly glabrous at top; style slender, ·15 to ·2 in. long, stigma capitate; cells 3, ovules 2 in each cell. *Fruit* ovoid-cylindric, blueish-purple when ripe, ·3 to ·4 in. long, ·2 in. broad, surmounted by calyx-rim with patent lobes, nearly as wide as the top of the fruit; exocarp crustaceous; endocarp very hard, bony, obscurely ribbed and irregularly indented. *Seed* 1, testa membranous, albumen fleshy, embryo straight. Brand Monog. Sympl. 58. *Symplocos* No. 42, Herb. Ind. Or. Hook. f. & Th.

PERAK: on Gunong Bubu, 5,000 feet, *Wray* 3919; *Scortechini*. MALACCA: on Mount Ophir, *Griffith* (K.D.) 3650; *Ridley* 10083; *Derry* 623; *Lobb*.

The specimens of Wray and Scortechini have the leaves rounded at both ends, but there seems no reason to keep them as a separate variety from the specimens from Mount Ophir which are acute at apex and cuneate at base.

17. SYMPLOCOS CURTISII, Oliv. in Hook. Icon. t. 1757 (1888). A shrub or small tree, reaching 10 to 15 feet in height; branchlets slender, pale brown, glabrous; leaf-buds small, acuminate, pubescent. *Leaves* chartaceous; elliptic, abruptly long acuminate at apex, cuneate at base; glabrous on both surfaces, pale greenish-brown when dry; margins obscurely denticulate, slightly recurved; 4 to 9 in. long, 1·5 to 3 in. broad; midrib slender, raised beneath, impressed above; main-nerves 5 to 7 pairs, the lowest pair very near the margin, the rest gradually more and more distant, all curving upwards to and along the margin, where they form an intramarginal looped nerve; secondary nerves very few or none; reticulations transverse, fairly prominent, rather distant; petiole ·2 to ·4 in. long, channelled above. *Inflorescence* of short (up to ·4 in. long) racemes axillary to the upper leaves or on the young wood below them; racemes about 5-flowered; bract ovate-acute, ·1 in. long, keeled, villous; bracteoles 2, similar but smaller; pedicels stout, about ·05 in. long. *Calyx-tube* about ·1 in. long; lobes 5, ovate, obtuse, as long as tube, all minutely pubescent without. *Corolla-tube* very short, lobes elliptic-oblong, ·2 in. long, 5-nerved, white. *Stamens* many, 60 or more; filaments slender, longer than corolla-lobes; anthers rounded, minute; staminal bundles only noticeable in bud. *Ovary* villous, disk glabrous; style slender, ·2 in. long, stigma capitate; cells 3, ovules 2 in each cell. *Fruit* a cylindric oblong berry, bright blue when ripe, ·5 to ·8 in. long, somewhat constricted at about one-third distance from the top; the top surmounted by the calyx-rim and connivent teeth; exocarp

crustaceous, endocarp woody; cells 1 to 3. *Seed* usually 1, testa membranous, albumen fleshy, embryo straight. Brand Monog. Sympl. 69.

PENANG: *Curtis* 1099. PERAK: *Wray* 692, 2830; *Scortechini* 328, 646, 1423; *King's Collector* 2084, 2099, 2406, 8431.

18. SYMPLÒCOS CRASSIPES, Clarke in Hook. f. Fl. Br. Ind. III. 580 (1882). A tree (?); branchlets stout, smooth, grey. *Leaves* stoutly chartaceous; large, elliptic-lanceolate, abruptly acuminate at apex, subcordate or obtusely rhomboid at base; glabrous on both surfaces; margins sub-entire, slightly recurved; 6 to 7 in. long, 2 to 3 in. broad; midrib prominent, thick; main-nerves 10 to 12 pairs, irregular and at irregular angles, usually only slightly curved upwards to meet in a looped intramarginal nerve ·25 in. from margin; secondary nerves and few transverse reticulations prominent; petiole very stout, ·15 to ·2 in. long. *Racemes* axillary, 4-flowered; pedicels very small, ·1 in. long at most; bracts ovate-acute, like the rachis and calyx densely ferruginous-pubescent. *Calyx-tube* very short; lobes ovate, ·075 in. long. *Corolla-tube* short; lobes ·1 to ·15 in. long, oblong-obtuse. *Stamens* about 30, slightly exsert. *Ovary* 3-celled; disk fulvous-pilose. *Fruit* not known. Brand Monog. Sympl. 52.

MALACCA: on Mount Ophir, *Maingay* (K.D.) 960.

19. SYMPLOCOS PENANGIANA, King & Gamble, n. sp. A small tree (?); branchlets rounded, upper ones and innovations densely dark ferruginous-hirsute. *Leaves* chartaceous; lanceolate, long acuminate at apex, somewhat rounded at base; glabrous above, sparsely pilose beneath with long stiff ferruginous hairs especially on and along the nerves; greenish-brown when dry; margins distantly but sharply serrate in the middle part, entire on the acumination and near the base, revolute; 4 to 7 in. long, 1 to 1·25 in. broad; midrib prominent beneath, impressed above; main-nerves 4 to 6 pairs, irregularly distant, curving upwards and meeting about ·2 in. from the margin in a looped intramarginal nerve; secondary nerves and transverse reticulations scanty but prominent; petiole short, ·15 in. long, stout, hirsute. *Inflorescence* a sessile very short raceme or panicle of flowers on the young branches; bracts several, very small, densely rusty-hirsute. *Calyx-tube* short; lobes 5, oblong, obtuse, ·125 in. long, glabrous within, densely rusty-hirsute without. *Corolla-tube* short; lobes 5, oblong, rounded, ·2 in. long. *Stamens* about 30; filaments slender; anthers rounded. *Ovary* villous; style slender, pubescent, ·15 in. long; stigma capitate. *Fruit* unknown.

PENANG: at West Hill, 2,500 feet, *Curtis* 325.

20. SYMPLOCOS CERASIFOLIA, Wall. Cat. 4434 (1829). A tree, reaching 60 feet and even 80 feet in height; stem with a diam. of 20 in.; branchlets glabrescent, smooth, somewhat angled, reddish-brown; leaf-

buds nearly globose, scales rounded, acuminate. *Leaves* coriaceo-chartaceous; oblong or elliptic-oblong, acuminate at apex, cuneate or attenuate at base; glabrous above, sparsely pilose on the nerves beneath otherwise glabrous, dark greenish-brown when dry; margins crenately serrate except at the very base and on the acumination, slightly recurved; 5 to 7 in. long, 1 to 2 in. broad, midrib slender, impressed above; main-nerves 6 to 8 pairs, conspicuous, at once curving upwards and round to join each other in a well-marked looped ring ·2 to ·3 in. from the margin; reticulations transverse; petiole ·5 to ·7 in. long, slender, channelled above. *Inflorescence* of axillary and sub-terminal pubescent spikes; the rachis stout, angular; bracts broad, round, villous, early caducous; bracteoles 2, ovate-acute, ·075 in. long, villous; flowers about 12 in each spike. *Calyx-tube* short, ·05 in. long; lobes lanceolate, acute, pilose, ·125 in. long. *Corolla-tube* short; lobes oblong-acute, 3-nerved, ·2 in. long. *Stamens* about 30, or very numerous—over 100 (Scortechini), on the corolla-tube, fascicles not well separated; filaments very slender; anthers rounded, very minute. *Ovary* and disk slightly hairy; style slender, curved, ·2 in. long, stigma capitate; cells 3, ovules 2 to 3 in each cell. *Fruit* a cylindric oblong drupe 1·5 to 2 in. long, 1 in. broad, truncate at both ends and tipped above by the persistent calyx-tube and lobes, the rim about ·2 in. broad; smooth, yellowish-brown; exocarp thick, corky; endocarp woody with 7 to 8 sharp star-like ridges. *Seed* 1, testa membranous; albumen thin, embryo straight, pendulous; radicle long. A. DC. Prod. VIII. 257; Clarke in Hook. f. Fl. Br. Ind. III. 580; Miq. Fl. Ind. Bat. I. Pt. 2. 466; Brand Monog. Sympl. 52. *Bobua cerasifolia*, Miers in Journ. Linn. Soc. XVII. 304.

PENANG: *Wallich* 4434; *Curtis* 1503, 3096. PERAK: *Wray* 445, 3003; *Scortechini* 515; *King's Collector* 6283, 6950. MALACCA: *Maingay* (K.D.) 962

Scortechini considered his No. 515 to represent a species separate from *S. cerasifolia*, but with a large series of specimens before us we find it difficult to agree to this.

21. SYMPLOCOS RIGIDA, Clarke in Hook. f. Fl. Br. Ind. III. 581 (*not of* Wall.) (1882). A tree with spreading branches, reaching 60 to 80 feet in height and 18 to 24 in. in diam. of stem; branchlets stout, dark brown, glabrous, angled when dry, marked with the prominent round raised scars of fallen leaves; branch-buds large, covered with oblong glandular-serrate stipular scales, softly silky on the back; leaf-buds acuminate, ·3 to ·5 in. long, silky-pubescent. *Leaves* coriaceo-chartaceous; oblong or oblong-lanceolate, acute or shortly acuminate at apex, attenuate at base; glabrous on both surfaces

and usually shining, dark greenish-brown when dry; margins entire or very shortly serrate, recurved when dry; 6 to 12 in. long, 2·5 to 5 in. broad; midrib stout, much raised beneath, impressed above; main-nerves 10 to 13 pairs, raised beneath, curving upwards to and along the margin; secondary nerves few or none; reticulations transverse, parallel, not prominent; petiole ·7 to 1·3 in. long, stout, glabrous. *Inflorescence* of simple spikes, strobilate when young and scarcely ·5 in. long, in flower 1·5 to 2 in. long with pubescent rachis, in fruit reaching 3 in. long with stout nearly glabrous rachis, in the axils of upper leaves or the young branchlets below them; bracts broadly ovate, acute, concave, minutely grey or tawny-pubescent; bracteoles 2, lanceolate-acute, ·1 in. long, all early deciduous; buds ovoid, grey-pubescent. *Calyx-tube* ·075 in. long; lobes 4, ovate-acute, blunt, ·1 to ·15 in. long, both grey-pubescent. *Corolla-tube* short, lobes 5, white, oblong, acute, ·25 in. long, 5-nerved. *Stamens* in 5 bundles opposite the corolla-lobes, about 60; filaments very slender, outer ones longer than corolla-lobes; anthers rounded, minute. *Ovary* and disk glabrous; style curved, ·25 in. long, stigma capitate; cells 3, ovules 2 in each cell. *Fruit* ovoid-oblong, 1 to 1·5 in. long, ·75 to 1 in. broad, waxy greenish-white when half ripe, dark blue when ripe; pale brown, shining, smooth, obscurely angled when dry; surmounted by the calyx-rim ·15 in. broad with erect calyx-teeth; exocarp thick, fleshy; endocarp very hard, woody, with 8 sharp star-like ridges; cells 3. *Seeds* 1 to 3, testa thin fibrous, albumen fleshy, embryo straight, radicle long. Brand Monog. Sympl. 52. *Doxomma rigidum*, Miers in Trans. Linn. Soc. Ser. 2. Bot. I. 104. *Barringtonia rigida*, Clarke in Hook. f. Fl. Br. Ind. II. 510.

PERAK: *Wray* 1294, 3207; *Scortechini* 2046; *King's Collector* 4246, 4277, 4613, 5045, 5048, 6095, 6179, 7260, 7898, 8543, 10013. SELANGOR: *Ridley* 10544. MALACCA: *Maingay* (K.D.) 767, 965. SINGAPORE: *Cantley* 50; *Ridley* 1798, 5960.

22. SYMPLOCOS RUBIGINOSA, Wall. Cat. 4432 (1829). A large shrub or a tree sometimes reaching 70 to 100 feet in height and 15 to 20 in. or more in diam. of stem; branches stout, grey, nearly glabrous; branchlets stout, angled, glabrous or cinnamomeous- or ferruginous-hirsute; leaf-buds lanceolate, ·3 to ·4 in. long. *Leaves* coriaceo-chartaceous; obovate-oblong, acute or shortly and abruptly acuminate at apex, cuneate at base; glabrous above, pubescent especially on the nerves beneath, the pubescence pale rusty-brown, pale greenish-brown when dry; margins shortly dentate especially on the upper half, sometimes nearly entire, recurved; 5 to 11 in. long, 2 to 4 in. broad; midrib stout, prominent beneath, impressed above; main-

nerves 10 to 13 pairs, parallel, very prominently raised beneath and usually impressed above, curving upwards to and along the margin; secondary nerves few or none; reticulations many, prominent, transverse, parallel; petiole thick, densely pubescent, ·5 to 1 in. long. *Inflorescence* of simple erect spikes, from the axils of upper leaves or from the young branchlets below them; spikes 1 to 2 in. long, softly cinnamomeous-pubescent, the rachis stout especially in fruit; flowers about 12 to 16 in each spike, each flower supported by a broad ovate rounded bract ·175 in. long and two ovate-acute bracteoles ·1 in. long. *Calyx-lobes* ovate-lanceolate, acute, ·06 to ·07 in. long; tube as long as lobes. *Corolla-tube* short, lobes white, oblong, ·15 in. long, 3-nerved, glabrous. *Stamens* in 5 bundles opposite to the corolla-lobes, usually about 30; filaments unequal, the outer ones longer than the corolla-lobes; anthers minute, round. *Ovary* and disk glabrous, style slender, about ·15 in. long, stigma capitate or lobed; cells 3. *Fruit* an ovoid-oblong drupe, ·4 in. long, ·25 in. broad, surmounted by the calyx-rim ·1 in. in diam., pale brownish-yellow when dry, glabrous or softly pilose; exocarp thin, crustaceous, fragile; endocarp woody, faintly ridged; seeds usually 3. A. DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I. Pt. 2. 466; Clarke in Hook. f. Fl. Br. Ind. III. 580; Brand Monog. Sympl. 53. *Lodhra rubiginosa*, Miers in Journ. Linn. Soc. XVII. 299.

PENANG: *Wallich* 4432; *Curtis* 528, 1692; *G. King*. PERAK: *Scortechini* 1825; *King's Collector* 5192, 5771, 7112, 8105, 10015, 10021. MALACCA: *Maingay* (K.D.) 955; *Griffith* (K.D.) 3652. JOHORE: *Ridley* 11115. SINGAPORE: *Cantley* 72; *Ridley* 4117.—DISTRIB. Sumatra (*Forbes* 1991), Borneo (*Beccari* 1216, *Haviland* 1679, 3480).

Subgenus II.—CORDYLOBLASTE.

23. SYMPLOCOS CONFUSA, Brand Monog. Sympl. 88 (1901). A shrub, 5 to 8 feet high (Lobb); branchlets rough, dark brown, marked with prominent cushion-like scars, uppermost ones and innovations ferruginous-pubescent. *Leaves* chartaceous; variable in shape, elliptic-oblong to ovate-lanceolate bluntly acute at apex, attenuate often unequally at base; margins entire or slightly undulate, recurved; glabrous on both surfaces; 3 to 4 in. long, 1·5 to 2 in. broad; midrib slender; main-nerves irregular, about 6 pairs; secondary nerves and reticulations also irregular, indistinct; petiole ·2 to ·3 in. long, slightly pubescent. *Inflorescence* of very short, 1–4-flowered, axillary, grey-silky racemes about ·25 in. long; bracts very small, ovate-acute; bracteoles also minute, 2 to each pedicel; pedicels ·05 to ·1 in. long; flowers white, sweet-scented. *Calyx-tube*

campanulate, grey-silky, ·1 in. long; lobes 5, short, rounded, ciliate. *Corolla-tube* funnel-shaped, ·2 to ·3 in. long, glabrous; lobes 5, oblong, obtuse, spreading, ·15 in. long. *Stamens* very many (40 to 60), inside a staminal tube somewhat longer than the corolla-tube; filaments very short, slender; anthers small, rounded. *Ovary* and disk villous; style slender, hirsute or glabrescent, ·3 to ·5 in. long; stigma large, capitate. *Fruit* not known. *S. Henschelii*, Benth. & Hook. f. ex Clarke in Hook. f. Fl. Br. Ind. III. 588; Forbes & Hemsl. in Journ. Linn. Soc. XXVI. 73.

MALACCA: on Mount Ophir, *Griffith* (K.D.) 3644; *Lobb; Maingay* (K.D.) 954.—DISTRIB. Borneo (*Beccari* 2405), China.

This species, which in the Fl. Br. Ind. was placed under *S. Henschelii*, has been separated by Brand, who considers the true *S. Henschelii* (*Cordyloblaste Henschelii*, Moritzi in Bot. Zeit. vi. 604 (1848), to be a Java plant only. It is not thought necessary to maintain Clarke's var. *hirtistylis*.

24. SYMPLOCOS MAINGAYI, Benth. ex Clarke in Hook. f. Fl. Br. Ind III. 588 (1882). A tree with spreading branches reaching 40 to 60 feet in height and 10 to 15 in. in diam. of stem; branches stout, light brown; branchlets and innovations densely ferruginous-velvety-pubescent. *Leaves* chartaceous; elliptic-oblong, shortly acuminate at apex, broadly attenuate or rounded at base; glabrous or with a few scattered hairs above, sparsely pubescent beneath except the nerves which are hirsute, marked also beneath by numerous faint transverse lines; margins entire; 4 to 6 in. long, 2 to 2·5 in. broad; midrib stout, very prominent beneath, impressed above; main-nerves 8 pairs, curving upwards and joining in a looped intramarginal nerve, impressed above; secondary nerves few and with the reticulations irregular; petiole ·3 to ·5 in. long, stout, densely ferruginous-pubescent. *Inflorescence* of stout densely ferruginous-pubescent racemes, 1 to 1·5 in. long, bearing about 8 to 10 flowers, in the axils of the upper leaves; bract 1, ovate, acute, ·2 in. long; bracteoles 2, similar but smaller; pedicels stout, ·1 to ·15 in. long. *Calyx-tube* campanulate, densely rusty-pubescent; teeth 5, rounded, ·05 in. long. *Corolla-tube* narrow funnel-shaped, 1 to 1·5 in. long, densely white-tomentose without; lobes ·5 in. long, oblong, reflexed. *Staminal-tube* adnate to the corolla-tube as far as the lobes, then free above it; top of tube truncate, 15–20-lobed, the lobes separable as ligules; stamens inserted irregularly on the tube and lobes, about 40 to 60; free part of filaments short, slender; anthers ovoid. *Ovary* and disk hairy; style slender, as long as corolla-tube, stigma capitate; cells 3. *Fruit* obovoid, obtuse, glabrous, 1·75 in. long, 1·25 in. broad, crowned

with the remains of the calyx-rim ·125 in. wide, pericarp very thick, woody. Brand Monog. Sympl. 90.

PERAK: *King's Collector* 6728. MALACCA: *Maingay* (K.D.) 961.

25. SYMPLOCOS SCORTECHINII, King & Gamble, n. sp. A tree (?); branchlets pale brown, slender, scurfy; innovations sparsely grey-pubescent. *Leaves* chartaceous; oblong-lanceolate, attenuately blunt-acuminate at apex, cuneate at base; glabrous on both surfaces dark brown when dry, margins entire; 4 to 5 in. long, 1·5 to 2 in. broad; midrib slender, raised beneath, impressed above; main-nerves 8 to 10 pairs the lowest close to the margin, the others curved upwards to meet in a looped intramarginal nerve; secondary nerves many and, with the reticulations, irregular, fairly prominent; petiole ·5 in. long, channelled above, slightly pubescent when young. *Inflorescence* of axillary or pseudo-terminal racemes, ·7 to 1 in. long, sometimes giving the appearance of a terminal panicle; rachis grey-pubescent, angular; bract and 2 bracteoles lanceolate-acuminate, ·1 to ·15 in. long; pedicels ·2 in. long. *Calyx-tube* campanulate, ·2 in. long, grey-pubescent without, as are the rounded obtuse ·05 in. long teeth. *Corolla-tube* slender, funnel-shaped, 1 to 1·5 in. long, densely white-tomentose without; lobes ·5 in. long, oblong-obtuse, much imbricate in bud. *Staminal-tube* adnate to the corolla-tube as far as the lobes, then free above it, top of tube truncate, about 15-lobed, the lobes separable as ligules; stamens inserted irregularly on the tube and lobes, about 40 to 50; free part of filaments short, slender; anthers rounded. *Ovary* and disk hairy; style slender, as long as corolla-tube, stigma capitate; cells 3, ovules 2 in each cell. *Fruit* obovoid-oblong, obtuse, glabrous, 1·75 in. long, 1·2 in. broad, crowned with the remains of the calyx-rim ·1 in. in diam.; pericarp thick, corky; seed 1.

PERAK: *Scortechini*.

This species comes very near to *S. Maingayi* in respect to its flowers and fruit, but the branches are much more slender, the dense ferruginous tomentum is absent, and the leaves are different, so we have no hesitation in describing it as a new species.

The following Bornean species seems worthy of description here: it may possibly be found also in the Peninsula:—

SYMPLOCOS HAVILANDI, King & Gamble, n. sp. A small tree (?); branchlets stout, somewhat flattened, yellowish-brown; leaf-buds conical, glabrous. *Leaves* coriaceous; elliptic, abruptly acuminate at apex, acute at base; glabrous on both surfaces, orange-brown when dry; margins entire, recurved; 3 to 4 in. long, 1·25 to 1·75 in. broad; midrib stout, impressed above; main-nerves 7 to 8 pairs, the lowest pair near the margin and more acutely angled (about 45°) than the others, straight at first at an angle of 60°, then curved to meet in a widely looped intramarginal nerve, prominently raised above when dry; secondary-nerves and reticulations also raised; petiole ·4 to ·5 in. long, stout, rough, the upper half winged by the decurrent margin of the blade. *Inflorescence* a nearly sessile, few-branched panicle of racemes, about 1·5 in. long;

flowers about 12; rachis glabrous, flattened; bracts and bracteoles minute, caducous; pedicels none or very short, scarcely ·05 in. long; buds globose. *Calyx-tube* ·05 in. long; lobes orbicular, ciliate, as long as tube. *Corolla-tube* very short; lobes 5, ·15 in. long, ovate-oblong, ciliate. *Stamens* about 50, in 5 bundles of about 10 each, opposite the corolla-lobes; anther-cells orbicular; filaments slender, the longest as long as the petals. *Ovary* conical, glabrous; style slender, ·1 in. long, stigma capitate. *Fruit* not known.

BORNEO: in Sarawak, near Kuching, *Haviland* No. 1954.

2. STYRAX, Linn.

Trees and shrubs, usually more or less lepidote or stellate-tomentose on all parts except the upper-surface of the leaves, rarely glabrous. *Leaves* various in shape, entire or serrulate. *Flowers* generally white, in lax axillary or terminal, simple or compound, often pendulous racemes; bracts very small. *Calyx* campanulate, free or slightly adnate to the base of the ovary, truncate or 5-toothed. *Corolla-tube* short; lobes 5, erecto-patent, elliptic-oblong, imbricate or valvate. *Stamens* 10, 1-seriate at the base of the corolla-tube; filaments more or less flattened, continuous with the connective; anthers large, linear, the cells parallel, erect. *Ovary* nearly free, at first 3-celled, later often 1-celled; style subulate; stigma capitate, somewhat 3-lobed; ovules few in each cell, in free ovaries nearly all erect from the lower basal angle, in half-adnate ovaries upper pendulous lower erect. *Fruit* globose or ellipsoid, seated on the cupuliform or patelliform calyx, breaking up irregularly. *Seeds* 1 or rarely 2 or more, integuments 2, the outer chartaceous or hardened, the inner membranous; albumen fleshy, copious; embryo straight, axile or excentric; cotyledons broad, with a longish terete radicle.—DISTRIB. Warmer regions of Asia and America, a few extending to temperate Asia and South Europe, species about 60.

Leaves green beneath, slightly stellate-pubescent	1. *S. serrulatum.*
Leaves white or greyish-white beneath, with occasional rusty-stellate hairs :—	
Leaves small, under 5 in. long and 2·5 in. broad; calyx about one-third of the length of the corolla	2. *S. Benzoin.*
Leaves large, over 5 in. long and 2·5 in. broad; calyx about half of the length of the corolla	3. *S. crotonoides.*

1. STYRAX SERRULATUM, Roxb. Fl. Ind. II. 415 (1832). A shrub or small tree, reaching 50 feet in height; branches slender, branchlets stellately grey-pubescent. *Leaves* membranous; ovate or ovate-lanceolate, acuminate at apex, rounded or cordate, sometimes acute at base; nearly glabrous above, glabrescent beneath, but with stellate hairs on both sides of the nerves; margins sparingly and irregularly serrate, sometimes sub-

entire, slightly revolute; 1·5 to 5 in. long, 1 to 2 in. broad; midrib slender; main-nerves 6 to 8 pairs, curving upwards and anastomosing near the margin; secondary nerves and reticulations prominent, the latter transverse; petiole ·2 in. long, stellate-pubescent. *Racemes* terminal or from the axils of the uppermost leaves of the branchlets, 6–8-flowered or fewer, sometimes reduced to 1 only, sometimes paniculate from the absence of leaves, 1 to 2 in. long; rachis slender, densely white-stellate-pubescent; pedicels ·2 in. long; bracteoles linear, nearly as long as pedicels; flowers white. *Calyx* campanulate; tube white-pubescent without, glabrous within, ·15 in. long; teeth 5, ·05 in. long, irregular, repand-dentate, white-pubescent on both sides. *Corolla-tube* ·15 in. long, cylindric; lobes 5, ·25 in. long, oblong, sub-acute, densely white-pubescent without and within except the lower part of the tube. *Stamens* 10, 2·5 in. long; filaments inserted on the corolla-tube, wide and white-tomentose at the base, narrower and glabrous above, continued in the connective; anthers broadly linear, erect, as long as the filaments, rounded at top, cells 2 parallel. *Ovary* densely white-villous; style slender, ·3 in. long; stigma small, capitate; cells 3. *Fruit* ellipsoid, ·4 to ·5 in. long, ·3 in. broad, white- or grey-pubescent, supported by the patelliform calyx; pericarp fleshy, rather thin, irregularly breaking up. *Seeds* 1, rarely 2 or more; outer integument smooth, hard, shining, brittle; inner one membranous, brown; albumen firm, grey; embryo erect, nearly as long as the endosperm; cotyledons cordate, ·15 in. long; radicle thick, terete, as long as cotyledons. Wall. Cat. 4402; A. DC. Prod. VIII. 267; Hook. f. in Bot. Mag. t. 5950 (*syn. excl.*); Kurz in Journ. As. Soc. Beng. XLVI. ii. 237 and For. Fl. II. 142; Clarke in Hook. f. Fl. Br. Ind. III. 588; Prain Beng. Plants I. 656. *S. Porterianus*, Wall. Cat. 4401; A. DC. l.c.; Miq. Fl. Ind. Bat. I. Pt. 2, 463. *S. floribunda*, Griff. Notul. IV. 287.

PENANG: *Wallich* 4401; *Phillips*; *Curtis* 1187, 1538; *Ridley* 7176. PERAK: *King's Collector* 1662.—DISTRIB. India, at 3,000 to 7,000 feet from Nepal to Assam, Chittagong and Burma.

The plant is frequently affected by galls.

2. STYRAX BENZOIN, Dryand. in Phil. Trans. Vol. LXXVII. 308, t. 12 (1787). A tree with slender drooping branches, reaching 60 to 80 feet in height and 2 to 3 feet in diam. of stem; branches rounded, glabrous; upper branchlets rusty-grey-stellate-pubescent. *Leaves* chartaceous; elliptic, acuminate at apex, attenuate or rounded at base; glabrous above, densely grey-stellate-pubescent beneath; margins entire or rarely slightly denticulate; 4 to 5 in. long, 1·5 to 2·5 in. broad; midrib slender, prominent beneath, impressed above; main-nerves 6 to 8 pairs, curving

upwards to and along the margin; reticulations transverse, regular, prominent; petiole ·3 to ·5 in. long, channelled above, densely grey-stellate-pubescent. *Racemes* paniculate, terminal or axillary to the upper leaves, grey-stellate-pubescent; bracts ovate, caducous; pedicels slender, angular, ·1 to ·2 in. long; bracteoles linear, as long as the pedicels or nearly so; flowers silvery-white. *Calyx* cupular, ·15 in. long, densely grey-stellate-pubescent without; teeth 5, minute. *Corolla-tube* ·15 in. long, cylindric; lobes 5, ·3 in. long, oblong-linear, acute, white-pubescent without and more or less within, recurved. *Stamens* 10, ·3 in. long, attached to the tube of the corolla; filaments flattened, ·15 in. long, white-pubescent, continued in the connective; anthers linear, slender, erect, acute at tip, as long as filaments, cells parallel. *Ovary* conical, villous above; style slender, ·3 in. long; stigma small, capitate; cells 3, ovules 2 or more in each cell, placentas central. *Fruit* depressed-globose, variable in size, reaching ·8 in. in diam. and ·6 in. in height; white-pubescent, supported by the flattened persistent patelliform calyx; pericarp corky, rather thick, irregularly dehiscing. *Seed* usually 1, pale-brown with a broad basal hilum; outer integument hard, brittle, inner membranous; albumen firm; embryo horizontal or oblique, nearly as long as the endosperm; cotyledons flattened, oblong-cordate, ·2 in. long; radicle smooth, ·15 in. long, cylindric. Blume Bijdr. 671; Roxb. Fl. Ind. II 416; A. DC. Prod. VIII. 260; Bentl. & Trim. Med. Pl. III. t. 169; Miq. Fl. Ind. Bat. I. Pt. 2, 463; Clarke in Hook. f. Fl. Br. Ind. III. 589; Gürke in Engl. & Prantl Pflanzenfam. IV. i. 178, fig. 93; Koord. & Val. Bijdr. VII. 132.

PERAK: *Wray* 808, 1208; *Scortechini* 1998; *King's Collector* 4459, 7840, 7884, 8615, 10203, 10305. MALACCA: *Maingay* (K.D.) 963, 964; *Griffith* (K.D.) 3668. SINGAPORE: *Ridley* 2650.—DISTRIB. Sumatra (*Beccari* 699; *Forbes* 3120A); Java (*Forbes* 1183).

This species gives the gum "Benzoin," or "Benjamin," of commerce. The plant is often affected by galls, causing curious tassel-like excrescences on the branches. The tree has the odour of violets (*Wray*).

3. STYRAX CROTONOIDES, Clarke in Hook. f. Fl. Br. Ind. III. 589 (1882). A tree, 60 to 80 feet high and 15 to 20 in. in diam. of stem; branches spreading and drooping; branchlets rather thick, grey, ultimate ones and innovations densely clothed with whitish-grey and rusty-stellate tomentum, the rusty hairs large and scattered among the rest. *Leaves* chartaceo-coriaceous; broadly oblong or elliptic-oblong, abruptly acuminate at apex, attenuate or cuneate at base; glabrous above except on the nerves, densely white-tomentose beneath, and with scattered rusty-stellate hairs; margins entire or undulate; 5 to 7 in. long, 2·5 to

4 in. broad; midrib prominent beneath, impressed and stellate-pilose above; main-nerves about 10 pairs, prominent, arched upwards to and along the margin; reticulations prominent, transverse; petiole ·3 to ·4 in. long, stellate-pubescent. *Racemes* in terminal and axillary panicles, 4 to 8 in. long, densely white-tomentose and rusty-stellate-pilose, including calyx; pedicels very short, 0 to ·15 in. long; bracts oblong-lanceolate, glandular-dentate, ·25 in. long; bracteoles 2, linear-subulate, ·15 in. long; flowers creamy-white. *Calyx-tube* cupular, ·2 to ·25 in. long, truncate; teeth 5, very minute. *Corolla-tube* short, ·15 long, glabrous at the very base, appressed white-pubescent above; lobes 5, valvate, ·3 in. long, linear-oblong, acute, afterwards recurved. *Stamens* 10, about ·3 in. long; filaments short, flat, glabrous, continued in the connective which is white-pubescent on the back; anthers ·2 in. long, linear, mucronate, cells parallel. *Ovary* 5-lobed, white-villous, conical; style slender, as long as corolla; stigma capitate; cells 3, ovules 5 to 6, erect. *Fruit* ovoid, grey-pubescent, mucronate, ·75 to 1 in. in diam., supported by the cupuliform calyx; pericarp thick, corky. *Seed* 1, outer integument pale brown, smooth, crustaceous, with a broad basal hilum, inner integument membranous; albumen firm, endosperm cushion-like; embryo somewhat oblique; cotyledons cordate, ·2 in. long; radicle thick, terete, as long as cotyledons. *Crotoni affinis* sp. Wall. Cat. 7348.

PERAK: *Scortechini* 179; *King's Collector* 7775, 7967, 8558, 10734. SINGAPORE: *Wallich* 7848; *Cantley* 60.

This species, like the others, is also frequently found with large tassel-like insect galls in place of the inflorescence.

Order LXXIV. OLEACEÆ.

Erect or climbing shrubs or trees, unarmed. *Leaves* usually opposite, rarely alternate or verticillate, simple or pinnately 3–few-foliolate, entire or toothed; stipules none. *Inflorescence* sometimes dichotomously cymose and centrifugal, sometimes trichotomously paniculate, some or all branches centripetal; cymes or panicles axillary or terminal. *Flowers* hermaphrodite, often dimorphous, sometimes polygamous or diœcious, regular. *Calyx* free, usually small, campanulate, 4- or more-toothed or -lobed, rarely 0. *Corolla* gamopetalous; tube long or short; lobes or petals 4 to 12, imbricate or induplicate-valvate in bud. *Stamens* usually 2, sometimes 4, inserted on the corolla, or hypogynous if the petals are free or 0; filaments usually short; anthers rather large, ovate or oblong, rarely linear, dehiscing on the margin. *Ovary* free, 2-celled; style short or long; stigma simple or 2-lobed; ovules 1 to 2, rarely more, in each cell, attached to the inner angle near the apex or base. *Fruit* capsular, loculicidally 2-valved or indehiscent, or a berry or drupe. *Seeds* solitary or 2 in each cell, erect or pendulous; testa thin or bony; albumen fleshy or horny or 0; embryo straight; radicle inferior or superior.—DISTRIB. Tropical and temperate regions of the world; genera about 18, species about 280.

Corolla-lobes imbricate:—
  Seeds exalbuminous; usually climbing shrubs .. .. 1. JASMINUM.
  Seeds albuminous; small trees .. .. 2. OSMANTHUS.
Corolla-lobes valvate:—
  Radicle superior; trees or erect shrubs:—
    Corolla-tube very short, petals often in pairs .. .. 3. LINOCIERA.
    Corolla tubular, sometimes absent .. .. .. 4. OLEA.
  Radicle inferior; climbing shrubs .. .. .. 5. MYXOPYRUM.

Nyctanthes Arbor-tristis, Linn., is found in gardens in cultivation.

1. JASMINUM, Linn.

Erect or climbing shrubs. *Leaves* opposite or rarely alternate, simple trifoliolate or imparipinnate, generally entire; petiole usually articulate. *Flowers* often handsome, white pink or yellow, often sweet-scented, in 2- or 3-chotomous or simple cymes or sometimes solitary, axillary or terminal, inflorescence centrifugal; bracts linear and small or ovate, sometimes petaloid, bracteoles usually linear. *Calyx-tube* usually funnel-shaped or campanulate; lobes 4 to 9, linear, long or short or 0. *Corolla-tube* narrow, more or less elongate; lobes 4 to 9, spreading, much imbricate. *Stamens* 2, usually included in the corolla-tube; filaments short; anthers oblong, attached to the filaments at the back near the base, cells parallel, connective broad, usually produced in a mucronate point. *Ovary* 2-celled; ovules usually 2 in each cell, attached near the base; style filiform, long or short, often both in different flowers on the same plant; stigma oblong or capitate, generally bifid. *Berry* didymous or simple by suppression of one carpel; carpels globose, ellipsoid or elongate, pericarp usually of two layers, the outer (exocarp) membranous, the inner (endocarp) fleshy or fibrous. *Seeds* usually 1 in each carpel, sometimes 2, testa very thin; albumen none; cotyledons plano-convex; radicle inferior, very small, included within the cotyledons or slightly exsert.—DISTRIB. Tropical and warm temperate regions of Asia, Africa, and Australia, one species in Europe, many in cultivation: about 90 species in all.

Leaves simple:—
  Leaves penninerved, basal pair of nerves not opposite nor produced to form an intramarginal nerve:—
    Inflorescence terminal:—
      Erect or straggling shrub .. .. .. 1. *J. Sambac.*

Climbing shrubs :—
Calyx-lobes ·2 in. long or longer ; leaves rather large :—
Leaves chartaceous :—
Leaves and branchlets fulvous-pilose, main-nerves 10 to 12 pairs .. .. 2. *J. Griffithii.*
Leaves and branchlets glabrous, main-nerves 6 to 8 pairs .. .. 3. *J. Maingayi.*
Leaves membranous :—
Calyx-lobes spreading, ·25 in. long or longer ; fruiting pedicels thickened .. .. .. 4. *J. Wrayi.*
Calyx-lobes erect, ·5 in. long ; pedicels very short 5. *J. Curtisii.*
Calyx-lobes under ·2 in. long, pubescent ; leaves small :—
Corolla-tube short, ·25 in. long .. .. 6. *J. decussatum.*
Corolla-tube ·6 to ·8 in. long.. .. .. 7. *J. bifarium.*
Inflorescence axillary .. .. 8. *J. adenophyllum.*
Leaves penninerved, basal pair of nerves opposite, produced to form an intramarginal nerve :—
Basal-pair of nerves prominent, branchlets round :—
Flowers in few-flowered long-peduncled cymes ; pedicels 1 to 1·5 in. long .. .. 9. *J. longipetalum.*
Flowers in many-flowered short-peduncled cymes ; pedicels under ·5 in. long .. .. 10. *J. smilacifolium.*
Basal pair of nerves not prominent, branchlets 4-angular .. 11. *J. insigne.*
Leaves 3-foliolate .. .. 12. *J. Scortechinii.*

1. JASMINUM SAMBAC, Ait. Hort. Kew. I. 8 (1789). A sub-erect, straggling, scarcely climbing shrub ; branches terete, smooth ; branchlets slender, pubescent. *Leaves* membranous ; variable, usually ovate, often broadly so, acute or obtuse at apex, cuneate or rounded or cordate at base ; glabrous above, pubescent on the nerves beneath, often with tufts of hair in the axils of the main-nerves ; margins recurved ; 1·5 to 4·5 in. long, 1 to 2·5 in. broad ; midrib slender, impressed above, raised beneath ; main-nerves 4 to 6 pairs, arching upwards to and along the margin, raised beneath ; reticulations distinct on both sides ; petiole ·1 to ·25 in. long, pubescent, articulate in the middle. *Flowers* white, very fragrant, solitary or in 2–3-flowered terminal pubescent cymes ; bracteoles linear-subulate ; pedicels ·25 in. long, pubescent. *Calyx*-tube campanulate, ·1 in. long ; teeth 5 to 9, linear-subulate, ·1 to ·25 in. long. *Corolla*-tube slender, funnel-shaped, ·5 in. long; lobes 8 to 9, spreading, as long as tube, oblong acute or obtuse. *Stamens* included in the tube ; filaments short ; anthers oblong. *Ovary* rounded ; style slender ; stigmas 2, clavate. *Berry* didymous or with 1 carpel only by suppression ; carpels black, ·25 in. in diam., sub-globose, surrounded by the sub-erect persistent calyx-teeth. Bot. Reg. t. 1 ; Bot. Mag. t. 1785 ; Wall. Cat. 2868 ; A.DC. Prod. VIII. 301 ; Wight Ic. t. 704 ; Dalz. & Gibs. Bomb. Fl. 137 ; Brandis For. Fl. 311 ; Kurz in Journ. As. Soc.

Beng. XLVI. ii. 242, and For. Fl. II. 153; Clarke in Hook. f. Fl. Br. Ind. III. 591; Blume Bijdr. 677; Miq. Fl. Ind. Bat. II. 542; Cooke Bomb. Fl. II. 111; Prain Beng. Plants 659. *J. fragrans*, Salisb. Prod. 12. *J. undulatum*, Willd. Sp. Pl. I. 36 (*not of* Ker). *J. Zambac*, Roxb. Hort. Beng. 2, and Fl. Ind. Ed. Carey & Wall. I. 87. *J. quinqueflorum*, Heyne; Wall. Cat. 2878; A.DC. l.c. 302. *J. pubescens*, Wall. Cat. 2880, *not of* Willd. *Nyctanthes Sambac* and *undulatum*, Linn. Sp. Pl. 8. *Mogorium Sambac*, Lamk. Dict. IV. 210; Ill. t. 6, fig. 1. *M. undulatum*, Lamk. Dict. IV. 212. "Kudda-mulla," Rheede Hort. Mal. VI. tt. 50, 51. Burm. Thes. Zeyl. t. 58, fig. 2.

Perak: *Scortechini* 997.—Distrib. India, Ceylon, Burma, Siam.

Much cultivated in India and in all tropical regions. The cultivated forms have many-flowered cymes and rounded corolla-lobes, and they are often found with double flowers.

2. Jasminum Griffithii, Clarke in Hook. f. Fl. Br. Ind. III. 593 (1882). A slender climbing shrub; branchlets densely and patently fulvous-villous. *Leaves* chartaceous; ovate- or elliptic-oblong, bluntly acute or acuminate at apex, rounded or cordate at base; fulvous-pilose on both surfaces, sparsely above, more densely beneath but glabrescent when old, the uppermost often whitened; 4 to 6 in. long, 1·5 to 3·5 in. broad; midrib prominent beneath; main-nerves 10 to 12 pairs, at first straight then arching upwards to join in a prominent looped intramarginal nerve; secondary nerves few; reticulations rather indistinct; midrib and all nerves impressed above and pilose, raised and densely fulvous-villous beneath, tufted in the axils; petiole stout, ·2 to ·4 in. long. *Flowers* creamy-white, in terminal, many-flowered, fulvous-pilose cymes, 1 to 1·5 in. long and up to 2 in. broad; bracts leafy, lanceolate, about ·5 to 1 in. long, few; bracteoles many, linear, similar to calyx-lobes, of various lengths. *Calyx-tube* slender, ·1 in. long; lobes 5, linear, ·2 in. long. *Corolla-tube* slender, slightly enlarged above, ·75 in. long; lobes 5, spreading, ·25 in. long, elliptic, apiculate; lobes and tube minutely pubescent without. *Stamens* included or slightly exsert; filaments broad; anthers oblong-lanceolate with a broad connective, ·15 to ·2 in. long. *Ovary* glabrous; style slender; stigma clavate. *Berry* didymous; carpels waxy-white, globose, ·3 to ·4 in. in diam., pericarp crustaceous, glabrous. *Seed* usually one, testa fibrous; cotyledons thick, plano-convex, ·2 in. in diam.

Perak: *King's Collector* 10229. Malacca: *Griffith* (K.D.) 3704. Singapore: *Ridley* 8465.

Var. *cuspidata*, King & Gamble. *Leaves* thinner than in the type, oblong, abruptly and sharply cuspidate-acuminate at apex, attenuate and abruptly rounded at base, 5 to 5·5 in. long, 1·5 to 2 in. broad, much less pilose, main-nerves 8 to 10 pairs; seeds 1 to 2, testa crustaceous.

PENANG: *Curtis* 2787. MALACCA: *Maingay* (K.D.) 998. JOHORE: at Gunong Palai, 1,400 feet, *G. King*.

3. JASMINUM MAINGAYI, Clarke in Hook. f. Fl. Br. Ind. III. 594 (1882). A climbing shrub; branchlets light brown, terete, internodes somewhat elongate, innovations and inflorescence tawny-pubescent. *Leaves* chartaceous; ovate or ovate-oblong, acuminate and often mucronate at apex, rounded or attenuate or cuneate at base; glabrous on both surfaces; margins recurved; 3 to 6 in. long, 2 to 2·5 in. broad; midrib stout; main-nerves 6 to 8 pairs, arching upwards to join in a looped intramarginal nerve about ·2 in. from the margin; secondary nerves few; reticulations distant, obscure; all nerves strongly impressed above and raised beneath; petiole ·5 to ·7 in. long, articulate in the middle, twisted, the bases of each pair connected by a raised nodal line. *Flowers* in terminal or axillary, paniculate, tawny-pubescent, trichotomous cymes, 1·5 to 2 in. long, sessile or peduncled; bracts oblong or spathulate, leafy; bracteoles linear, about ·25 in. long or less; pedicels blueish, ·15 in. long; flowers white, sometimes slightly tinged with pink. *Calyx-tube* campanulate, ·07 to ·1 in. long; teeth 6, linear-subulate, ·325 in. long. *Corolla-tube* slender, ·5 to ·7 in. long, glabrous; lobes 8 to 10, spreading, rotate, oblong-lanceolate, apiculate, ·4 in. long, with prominent nerves. *Stamens* included in the corolla-tube; filaments slender, appressed to the tube; anthers oblong, mucronate, ·15 in. long, connective broad. *Ovary* cylindrical, glabrous; style slender, ·4 to ·5 in. long; stigma clavate. *Fruit* of one carpel, oblong, ·5 in. long, ·3 in. broad, exocarp thin shining, endocarp fibrous. *Seeds* 2, testa thin. Hook. f. Bot. Mag. t. 7823.

PENANG: *Maingay* (K.D.) 1000; *Curtis* 643. PERAK: *Scortechini* 139, 304; *Curtis* 2032; *King's Collector* 2761, 2762, 3975.—DISTRIB. Borneo (*Haviland & Hose* 911).

VAR. *kedahensis*, King & Gamble. *Branchlets* and inflorescence thickly rusty-pubescent. *Leaves* more ovate, rounded at base, nerves fewer, rarely 3 to 4 pairs, the two lower pairs very strong. *Drupe* nearly globose.

KEDAH: *Ridley* 5535.

A well-marked variety which may prove, when better known, to be a species.

4. JASMINUM WRAYI, King & Gamble, n. sp. A slender climbing shrub; branchlets pale brown, slender, terete. *Leaves* membranous; oblong or obovate-oblong, acuminate at apex, attenuate or rounded, sometimes slightly auricled at base; glabrous on both surfaces except

for tufts of tawny hairs in the axils of the main-nerves beneath; 3 to 7 in. long, 1·5 to 2·5 in. broad; midrib very slender, raised beneath; main-nerves about 7 pairs, curving upwards to and along the margin where they are obscurely connected in an intramarginal looped nerve, usually slightly impressed above and raised beneath; secondary nerves and reticulations obscure; petiole ·3 to ·5 in., slender, twisted. *Flowers* cream-coloured, in terminal, about 15–20-flowered corymbose cymes 2 to 3 in. long; peduncle 1 to 1·5 in. long; branches at right angles to rachis in fruit, ·7 to 1 in. long; bracts lanceolate-acuminate, ·5 in. long; bracteoles linear-subulate, ·2 to ·3 in. long; pedicels slender in flower, clavately-thickened in fruit and then ·3 to ·5 in. long. *Calyx-tube* very short; lobes 5, linear-subulate, spreading, curved, ·25 in. long, glabrous or slightly pilose. *Corolla-tube* slender, ·75 in. long, slightly enlarged above; lobes 8 to 9, narrow, ·3 to ·4 in. long. *Stamens* included in the corolla-tube; filaments short; anthers oblong, long-mucronate. *Ovary* cylindric, depressed; style slender; stigma slightly clavate. *Fruit* didymous; carpels ovoid-globose, greenish-white, ·25 to ·5 in. long, exocarp thin shining, endocarp fibrous. *Seed* 1, testa very thin, membranous; cotyledons plano-convex, thick.

PERAK: *Wray* 2297, 2905, 3147; *King's Collector* 1838, 2484.

VAR. *hispida*, King & Gamble. Upper branchlets and inflorescence including calyx sparsely hispid, also midrib and main-nerves of leaves beneath; under-surface of leaves often pubescent; main-nerves up to 10 pairs.

PERAK: *King's Collector* 5893, on limestone hills. SELANGOR: *Curtis* 3774.

VAR. *axillaris*, King & Gamble. *Leaves* rather small, sparsely pubescent, especially on the midrib and main-nerves; inflorescence axillary, few-flowered (5 to 7), calyx hispid; fruit large, up to ·5 in. in diam.

PERAK: on Maxwell's Hill, 3,000 feet—a slender climber, *Scortechini* 273.

5. JASMINUM CURTISII, King & Gamble, n. sp. A climbing shrub (?); branchlets slender, terete, minutely rusty-pubescent. *Leaves* membranous; ovate or ovate-oblong, acuminate at apex, rounded at base; glabrous on both surfaces except for pubescence on the nerves above and tufts of hair in the axils of the main-nerves beneath; 3 to 5 in. long, 1 to 2 in. broad; midrib slender; main-nerves 5 to 6 pairs, distant, curving upwards and joining in a looped nerve ·1 to ·2 in. from the margin, raised and prominent on both surfaces; secondary nerves and reticulations few, irregular; petiole ·4 in. long, pubescent, twisted, articulate in the middle, the bases of each pair connected by a faint

nodal line. *Flowers* in a terminal trichotomous rusty-pubescent cyme, supported by pale (white ?) leafy, ovate-lanceolate, pubescent bracts 1 to 1·25 in. long; bracteoles similar but smaller; pedicels ·15 in. long; flowers in each cyme about 15 to 20. *Calyx-tube* campanulate, ·15 in. long; lobes 6, linear-subulate, ·5 in. long. *Corolla-tube* slender, cylindrical, 1 in. long; lobes 8 to 9, spreading or recurved, ·5 in. long, oblong-lanceolate, acute. *Anthers* oblong, ·125 in. long, mucronate. *Ovary* cylindric, glabrous; style slender; stigmas 2, clavate. *Fruit* not known.

PERAK: at Ipoh, *Curtis*.

A remarkable species, distinguished by the very long hair-like calyx-lobes and the coloured or white large leafy bracts and bracteoles.

6. JASMINUM DECUSSATUM, Wall. Cat. 2860 (1829). A climbing shrub; branchlets slender, densely rusty-pubescent. *Leaves* chartaceous; ovate or ovate-lanceolate, acuminate at apex, rounded at base; sparsely pubescent above, more densely so beneath; 2 to 4 in. long, 1 to 1·5 in. broad; midrib rather stout; main-nerves 4 to 5, lowest pair obscure, rest curved upwards to meet near the margin, impressed above, raised beneath; petiole ·3 to ·4 in. long, pubescent, articulate near the base, the bases of each pair of petioles (as also branchlets) joined by a raised nodal line on either side. *Flowers* in densely pubescent axillary and terminal trichotomous corymbose cymes about 1 to 2 in. long, supported by a pair of large leaf-like bracts; bracteoles linear-subulate; pedicels ·1 to ·2 in. long. *Calyx-tube* short; teeth 6, subulate, ·1 in. long. *Corolla-tube* slender, ·25 in. long; lobes 8 to 9, as long as tube, oblong-lanceolate, apiculate. *Stamens* included in the corolla-tube; filaments short; anthers oblong, ·1 in. long, mucronate. *Ovary* rounded, glabrous; style slender, longer than the corolla-tube (in short-stamened flowers); stigmas two, clavate. *Fruit* of one ellipsoid carpel, ·2 to ·3 in. long, glabrous. A.DC. Prod. VIII. 306; Kurz in Journ. As. Soc. XLVI. ii. 241, and For. Fl. II. 151; Clarke in Hook. f. Fl. Br. Ind. III. 596.

PENANG: *King's Collector* 1425, at Trang, 100 to 300 feet.—DISTRIB. Burma (*Wallich* 2860, *Griffith* 3699).

7. JASMINUM BIFARIUM, Wall. Cat. 2866 (1829). A climbing shrub; branchlets slender, terete, brown when dry, pubescent or nearly glabrous. *Leaves* chartaceous, usually bifarious; ovate or ovate-oblong, acuminate at apex, rounded or truncate sometimes almost cordate at base; pubescent or sometimes nearly glabrous on both surfaces; 2 to 3 in. long, 1 to 1·5 in. broad; midrib slender, pubescent, impressed above, raised beneath; main-nerves 4 to 6 pairs, pubescent, prominent beneath, arched upwards to join in an intramarginal nerve; secondary nerves and reticulations very obscure; petiole ·2 to ·3 in. long, twisted, articu-

late in the middle, the bases of each pair connected (as are the branchlets) on either side by a raised nodal line. *Flowers* white, in few- (4–12-) flowered, pubescent, sub-capitate cymes, sub-sessile in the axils of the two uppermost bract-like leaves; bracteoles linear-subulate, ·15 in. long; pedicels ·1 in. long. *Calyx-tube* campanulate; teeth 5 to 7, linear-subulate, ·1 to ·15 in. long. *Corolla-tube* slender, cylindric, ·6 to ·8 in. long; lobes 6 to 9, ovate-oblong, spreading, apiculate, ·2 to ·3 in. long. *Stamens* included in the corolla-tube; filaments short, slender; anthers oblong, mucronate, ·1 to ·15 in. long, connective broad. *Ovary* cylindric, glabrous; style slender, exsert; stigmas 2, clavate. *Fruit* a didymous berry; carpels ovoid, ·5 in. long, ·2 in. broad; exocarp membranous shining, endocarp fibrous. *Seed* conform to carpel, testa very thin, membranous. A.DC. Prod. VIII. 305; Clarke in Hook. f. Fl. Br. Ind. III. 595. *J. bracteatum*, Wall. Cat. 2867. *J. nummularoides*, Blume Mus. Lugd. Bat. I. 275; Miq. Fl. Ind. Bat. II. 537.

PENANG: *Wallich* 2866, 2867; *Curtis* 1920; *Ridley* 9361. PERAK: *Wray* 4180; *King's Collector* 860, 4920, 10699; *Deschamps*; *Scortechini* 59, 144, 238. SELANGOR: *Ridley* 7550, 8567. PAHANG: *Ridley* in Trans. Linn. Soc., Ser. 2, III. 319.—DISTRIB. Java.

VAR. *glabra*, Clarke in Hook. f. Fl. Br. Ind. III. 595. *Leaves* larger, elliptic, rhomboid or rounded at the base, more glabrous, less bifarious; calyx-teeth rather longer. *J. Lessertianum*, A.DC. Prod. VIII. 304.

JUNKSEYLON (Tongka): *Curtis* 2911. PENANG: *Maingay* (K.D.) 999; *Deschamps*. PERAK: *Wray* 4180; *Scortechini*; *Kunstler* 122. MALACCA: *Griffith* (K.D.) 3708; *Goodenough* 1995. JOHORE: *Ridley* 4217. SINGAPORE: *Lobb*; *Ridley* 10760.—DISTRIB. Sumatra.

8. JASMINUM ADENOPHYLLUM, Wall. Cat. 2876 (1829). A very slender wiry climber; branchlets extensively twining, glabrous. *Leaves* membranous; ovate-lanceolate to elliptic-oblong, variable, acuminate and mucronate at apex, cuneate at base; glabrous above except on the midrib, glabrous beneath except the tuft of tawny hairs in the axils of the main-nerves; margins somewhat undulate; 1·5 to 5 in. long, ·75 to 1·5 in. broad; midrib slender; main-nerves very slender, obscure, about 6 pairs, curving upwards to meet in a faint intramarginal looped nerve; petiole slender, twisted, articulate in the middle, ·2 to ·3 in. long, hispid. *Flowers* white, solitary, or 2 to 3 together in a slender, sometimes leafy, umbel from the axils of the leaves; peduncle ·75 to 1·25 in. long, flattened above and with a pair of opposite bracts near the middle; bracts of umbel 2, linear-subulate, ·3 in. long; pedicels very slender, ·75 to 1 in. long, clavately enlarged in fruit. *Calyx-tube* campanulate, glabrous, ribbed, ·1 in. long; lobes linear-subulate, keeled on the back,

sparsely hispid, ·4 to ·5 in. long, points recurved. *Corolla-tube* slender, funnel-shaped, ·75 in. long; lobes as long or slightly longer, 8 to 9, recurved, oblong-ligulate, about ·25 to ·3 in. broad. *Stamens* included in the corolla-tube; filaments short, slender; anthers oblong, mucronate, ·15 in. long, connective broad. *Ovary* cylindric; style slender; stigma clavate. *Fruit* globose, shining, young carpels ·25 in. in diam. A.DC. Prod. VIII. 314; Clarke in Hook. f. Fl. Br. Ind. III. 597.

PENANG: *King's Collector* 1736.—DISTRIB. Khasia Hills (*Wallich*).

This species is clearly quite a small climber, and while the Penang specimens have only small leaves those from the Khasia Hills show comparatively large ones, but this is not unnatural, and we believe the identification to be correct.

9. JASMINUM LONGIPETALUM, King & Gamble, n. sp. A large climbing shrub, reaching 30 to 40 feet; branchlets slender, terete, pale brown. *Leaves* chartaceo-coriaceous, 3-nerved; elliptic, acute or shortly acuminate at apex, attenuate or cuneate or slightly rounded at base; glabrous on both surfaces; margins slightly recurved; 2 to 6 in. long, 1·5 to 3 in. broad; midrib slightly impressed above, shortly raised beneath; main-nerves 7 to 8 pairs, the basal pair opposite, at about 25° with the midrib produced in an intramarginal nerve about ·25 in. from the margin, looped where the others, which are at about 65° with the midrib, join it; secondary nerves and reticulations very indistinct; petiole ·2 to ·4 in. long, twisted. *Flowers* white tinged with pink, fascicled 3 to 6 together in the axils of the upper leaves, forming sessile umbellate cymes; bracts very small, ovate-acute, deciduous; pedicels 1 to 1·5 in. long, very slender, summit enlarged in fruit. *Calyx-tube* short; lobes 6, glabrous, linear-subulate, ·1 in. long, margins inflexed. *Corolla-tube* very slender, ·75 in. long; lobes 9, linear-oblong, acute, 3–5-nerved, ·75 to 1 in. long, much recurved in flower. *Stamens* within the tube; filaments short, slender; anthers oblong, ·175 in. long, obtuse. *Ovary* glabrous, 2-celled; style slender; stigma flattened, minutely pubescent. *Fruit* didymous; carpel usually 1 only by suppression, black, globose, ·4 to ·5 in. in diam.; pericarp fleshy, glabrous. *Seeds* 2, testa very thin, cotyledons plano-convex.

PERAK: *King's Collector* 2765, 6005—on rich soil at 300 to 800 feet elevation, scarce. SINGAPORE: *Ridley* 10937.

A particularly handsome and well-defined species, which is well worthy of garden cultivation.

10. JASMINUM SMILACIFOLIUM, Griff. MS., Clarke in Hook. f. Fl. Br. Ind. III. 600 (1882). A large glabrous climbing shrub; branchlets pale brown, terete. *Leaves* coriaceous, 3-nerved; ovate, abruptly caudate-

acuminate at apex, obtuse or nearly cordate at base; margins entire, recurved; 5 to 7 in. long, 3 to 4 in. broad; midrib very prominent, impressed above, much raised beneath; two lowest main-nerves very prominent, similar to the midrib, curved upwards to form a pair of intramarginal nerves meeting at the apex; remaining main-nerves irregular, 3 to 4 pairs, inconspicuous; secondary nerves and reticulations raised above; petiole ·75 in. long, twisted, articulate in the middle. *Inflorescence* of axillary 5–20-flowered cymes; rachis jointed, terete; bracts spathulate, ·1 to ·2 in. long; bracteoles smaller, linear; pedicels ·2 to ·3 in. long, greatly enlarged in fruit; flowers white, tinged with pink. *Calyx* campanulate, tube ·15 in. long; teeth 5, ·05 in. long. *Corolla-tube* slender, cylindrical, ·75 to 1 in. long; lobes oblong, acute or apiculate, ·75 in. long, ·2 in. broad. *Stamens* inserted in the throat of the tube; filaments short; anthers linear-oblong, ·25 in. long, mucronate. *Drupe* didymous; carpels ellipsoid, ·1 in. long, ·3 to ·4 in. broad, smooth, shining.

MALACCA: *Griffith* (K.D.) 3698; *Maingay* (K.D.) 997.

11. JASMINUM INSIGNE, Blume Mus. Bot. Lugd. Bat. I. 278 (1849). An extensively climbing shrub; branches obscurely quadrangular with pale-grey corky bark; branchlets acutely quadrangular, glabrous, the edges pale-corky-winged. *Leaves* chartaceo-coriaceous; opposite, occasionally whorled; elliptic or elliptic-oblong, acute at apex, cuneate at base; glabrous on both surfaces; margins recurved; 2 to 8 in. long, 1 to 4 in. broad; midrib slender, raised beneath; main-nerves 6 to 7 pairs, the basal pair faint, opposite, at about 30° with the midrib, produced in an intramarginal nerve ·1 to ·2 in. from the margin, looped where the others, which are at 50° to the midrib, join it; secondary nerves and reticulations obscure; petiole ·4 to 1·2 in. long, twisted, the upper part bordered for a short distance by the decurrent margins of the blade. *Flowers* white, in compact, many-flowered, glabrous cymes from the axils of the leaves or (more usually) from the stem; bracteoles subulate, ·1 to ·15 in. long, caducous; pedicels stout, ·2 in. long, somewhat angular. *Calyx-tube* campanulate, ·25 in. long; lobes 4 to 5, linear-subulate, unequal, ·25 to ·35 in. long, points hooked. *Corolla-tube* slender, ·75 to 1 in. long, somewhat inflated above; mouth slightly thickened; lobes 4 to 5, spreading, ovate-oblong, apiculate, ·5 in. long, ·3 to ·4 in. broad. *Stamens* in the tube of the corolla; filaments flattened; anthers oblong, mucronate, ·25 to ·3 in. long. *Ovary* glabrous, rounded; style slender, clavate, obscurely cleft in 2 short stigmas; cells 2. *Fruit* didymous; carpels oblong, smooth, white when ripe. Miq. Fl. Ind. Bat. II. 541. *J. cauliflorum*, Scortechini MS. in Herb. Calcutta.

PERAK: at Theripay Taipay, *Scortechini; Wray* 2840; *Cantley* 23; *King's Collector* 2890, 3398, 7059.—DISTRIB. Sumatra, *Forbes* 2906.

A very fine species of well-marked characters.

12. JASMINUM SCORTECHINII, King & Gamble, n. sp. A slender climbing shrub, reaching 60 feet in length; branchlets dark-coloured, glabrous. *Leaves* thin when young, almost coriaceous when old, 3- sometimes 1-foliolate, opposite or sub-opposite; terminal leaflet ovate or lanceolate, acuminate at apex, rounded at base; glabrous on both surfaces, upper surface shining, nearly black when dry, lower surface dull, reddish when dry; 2·5 to 4 in. long, 1 to 1·5 in. broad; lateral leaflets similar but slightly smaller and often lanceolate; midrib slender, raised beneath; main-nerves very indistinct, apparently 6 to 8 pairs; petiole ·75 in. long, petiolule of end leaflet ·5, of side leaflets ·3 in. long, all grooved, slender, articulate below the leaflet. *Flowers* white, in axillary or terminal trichotomous cymes, terminal ones often paniculate; peduncles ·5 to 1 in. long; bracts ovate-acute or subulate, ·1 in. long; cymes sparsely scaly; bracteoles at the base of the calyx minute; pedicels ·1 to ·2 in. long, very much enlarged in fruit and then reaching ·5 to ·7 in. in length and ·3 in. in diam. at top. *Calyx-tube* campanulate, ·125 in. long; teeth 5, very short, triangular. *Corolla-tube* slender, enlarged above, ·4 to ·6 in. long; lobes 5, ovate-cordate, obtuse, ·3 to ·4 in. long, spreading. *Stamens* included in the corolla-tube; filaments short; anthers oblong, mucronate, ·15 in. long, connective broad. *Ovary* cylindrical, glabrous, 2-celled; style slender, as long as the corolla-tube; stigma clavate. *Fruit* didymous; carpels ellipsoid, ·75 to 1 in. long, ·5 in. broad; pericarp thin, crustaceous, blackish-brown. *Seed* nearly filling the cavity; testa thin, fragile; cotyledons oblong-obtuse, slightly auricled at base, ·5 to ·6 in. long by ·25 in. broad, plano-convex.

PENANG: *Curtis* 1227, 2031. PERAK: *Scortechini* 383, 479; *Ridley* 10679; *King's Collector* 7006, 7009; *Curtis* 169.

The description is largely after Scortechini MS. The species comes very near *J. lanceolaria*, Roxb., but differs in its more slender habit, thinner leaves, and large ellipsoid carpels.

Ridley's No. 8325 from Lankawi Island, Kedah, is a twiggy, apparently erect shrub with trifoliolate leaves, the leaflets all obovate-orbicular emarginate, the end one reaching 1·7 in. long and 1·3 in. broad, the side ones only about ·6 in. long and broad. The fruits are of one carpel about the size of a small pea, and the flowers are unknown. It may possibly not be a *Jasminum* (Herb. Kew).

The following species from Borneo is of interest, and may perhaps be found later on in the Peninsula:—

JASMINUM SARAWACENSE, King & Gamble, n. sp. A climbing shrub; branchlets pale brown, terete; internodes rather long. *Leaves* opposite, chartaceous; elliptic-oblong, long-acuminate at apex, cuneate at base; both surfaces glabrous; margins recurved; 4 to 7 in. long, 1·75 to 2·75 in. broad; midrib strong, impressed above, raised beneath; main-nerves 4 pairs, the lowest pair near the margin at an angle of about 30° with the midrib, the remaining pairs at about 50°, curving upwards to meet in an intramarginal looped nerve, which is also met by secondary nerves above the fourth pair; reticulations irregular, not prominent; petiole ·5 to ·75 in. long, twisted in the middle. *Inflorescence* of axillary, long-peduncled, trichotomous, pubescent, corymbose cymes, about 1 in. broad at top, usually 1 pair from each node; peduncle terete, 2 to 3 in. long, sometimes branched, minutely pubescent; branches very short, ·2 in. long; pedicels clavate, ·1 to ·15 in. long; bracts and bracteoles linear-subulate, ·25 in. long, one pair of bracteoles to each terminal fascicle of 3 flowers; flowers white, buds clavate, 1 in. long. *Calyx-tube* campanulate, ·15 in. long; lobes 6, linear-oblong, applicately infolded at the middle inwards, ·15 to ·2 in. long, pubescent. *Corolla-tube* cylindrical, 1 in. long; lobes 6, spreading, oblong, rounded at top, ·4 to ·5 in. long, prominently 3–5-nerved. *Stamens* 2, inserted at about the middle of the tube within; filaments short, decurrent within the tube; anthers linear-oblong, ·2 in. long. *Ovary* cylindric, truncate and depressed at top, 2-celled; style very slender; stigma clavate. *Fruit* not known.

BORNEO: near Kuching in Sarawak, *Haviland & Hose* 3489.

2. OSMANTHUS, Lour.

Trees or shrubs, glabrous. *Leaves* opposite, evergreen, entire or dentate. *Flowers* small, axillary or terminal, fascicled or in very short racemes, hermaphrodite or polygamous. *Calyx* short, 4-toothed or -lobed. *Corolla-tube* short or long; lobes 4, broad, obtuse, imbricate. *Stamens* 2, more rarely 4, inserted on the corolla-tube; anthers ovate, sub-extrorsely dehiscent. *Ovary* 2-celled, ovules 2 in each cell, pendulous from its apex; style short or cylindric, 2-lobed or sub-entire. *Drupe* ovoid or globose; exocarp fleshy, endocarp bony or crustaceous. *Seeds* usually solitary, pendulous; testa thin; albumen fleshy; cotyledons flat; radicle short, superior.—DISTRIB. N.W. Himalaya and eastwards to China and Japan, also in Western North America; about 8 to 10 species.

OSMANTHUS SCORTECHINII, King & Gamble, n. sp. A tree, reaching 40 to 50 feet in height, and 10 to 15 in. in diam. of stem; branchlets terete with pale grey, somewhat corky, bark. *Leaves* coriaceous; lanceolate, shortly acuminate at apex, cuneate at base; both surfaces glabrous; margins entire, recurved; 2 to 4 in. long, ·75 to 1·25 in. broad; midrib thick, impressed above, raised beneath; main-nerves very obscure, about 5 to 6 pairs; petiole broad, ·3 to ·6 in. long, channelled above and bordered by the decurrent margins of the blade. *Flowers* in very short, close, axillary racemes, reaching ·5 in. long in fruit, supported by a pair of ovate, acute, coriaceous bracts; pedicels slender, ·05 in. long. *Calyx* membranous, ·06 in. long; lobes 4, slightly serrate. *Corolla* campanulate, tube ·05 in. long; lobes ·1 in. long, oblong, obtuse, margins incurved.

Stamens 4, slightly exsert, inserted between the corolla-lobes at the top of the tube; filaments slender; anthers small, ovate, cells dehiscing on the margins or somewhat extrorsely. *Ovary* conical, glabrous; style slender, subulate, ·04 in. long; cells 2, ovules in each cell apparently 2. *Drupe* globose, ·2 to ·3 in. in diam.; dark greenish-blue when ripe, exocarp thin, fleshy, endocarp crustaceous. *Seed* 1, testa membranous; albumen fleshy, ruminate; cotyledons oblong, flat, narrow; radicle superior.

PERAK: *Scortechini* 414—at Thaipeng; *Wray* 682; *King's Collector* 5029, 6978.

The structure of the wood, so far as the examination of a very small branch goes, confirms the placing of this plant in the genus *Osmanthus*.

To this species seems also to belong *King's Collector* 3663, which has a bright red drupe reaching ·5 in. in length, slightly ribbed and with a spathulate embryo having the radicle nearly as long as the cotyledons, each ·1 in. It may be called VAR. *oblonga*.

3. LINOCIERA, Swartz.

Shrubs or trees. *Leaves* opposite, entire. *Flowers* small, in axillary or extra-axillary, rarely terminal, panicles or cymes; bracts generally small, sometimes rather enlarged and leafy; bracteoles very small. *Calyx* small, 4-fid or -toothed. *Corolla* of 4 petals, long or short, nearly free or cohering by pairs or very shortly connate, induplicate-valvate in bud. *Stamens* 2, rarely 4, inserted at the base of the petals and usually between the two cohering ones; filaments short; anthers elliptic or oblong, dehiscing on the margin or slightly extrorse; connective broad, often apiculate. *Ovary* 2-celled, ovules 2 in each cell, pendulous from its apex; style short; stigma bifid or entire. *Drupe* globose or ellipsoid; exocarp fleshy, thin, endocarp bony or crustaceous. *Seed* usually solitary, pendulous; testa thin; albumen fleshy or 0, if fleshy the cotyledons flattened, radicle superior.—DISTRIB. Tropics of both hemispheres, species about 40.

Leaves over 4 in. long, main-nerves prominent beneath:—
  Panicles 4 to 6 in. long, drupe ·75 in. long .. .. 1. *L. pauciflora.*
  Panicles 2 to 4 in. long, drupe 1·7 in. long .. .. 2. *L. macrocarpa.*
  Panicles 1·5 to 2 in. long, drupe not known .. .. 3. *L. paludosa.*
Leaves under 4 in. long, main-nerves obscure beneath, cymes scarcely 1 in. long .. .. 4. *L. caudata.*

1. LINOCIERA PAUCIFLORA, Clarke in Hook. f. Fl. Br. Ind. III. 609 (1882). A small tree, reaching 30 to 40 feet in height and 1·5 to 2 feet in diam. of stem; branches moderately stout, pale grey, smooth, swollen at the nodes, internodes slightly angular; branchlets darker coloured,

slender; leaf-buds linear-lanceolate. *Leaves* coriaceous; elliptic-oblong, rounded or shortly obtusely acuminate at apex, cuneate at base; glabrous on both surfaces, but with prominent raised glandular papillæ; 4 to 9 in. long, 2 to 4 in. broad; midrib stout, slightly impressed above, prominently raised beneath; main-nerves 11 to 13 pairs, fairly prominent and regular, curving upwards to and along the margin near which they anastomose; secondary nerves and reticulations obscure; petiole ·7 to 1·3 in. long, thickened at base. *Flowers* pale yellow or white, in compound axillary panicles, 4 to 6 in. long; main branches 1 to 2 in. long; rachis slender, glabrous, somewhat angular; bracts leafy, ovate or spathulate, ·5 to 1 in. or sometimes longer; bracteoles ovate-acute, very small; pedicels slender, ·05 to 1·5 in. long, much thickened and pale in fruit even when quite young. *Calyx-tube* short; teeth 4, ovate-acute, ·05 in. long. *Corolla-lobes* in two pairs, oblong, ·1 to ·15 in. long, slightly hairy within. *Stamens* ·05 in. long; filaments short, broad, anthers elliptic, emarginate, with a gland on the front of the connective. *Drupe* ellipsoid, ·75 in. long, ·3 to ·4 in. broad, blueish-black when ripe; exocarp fleshy, endocarp thin, crustaceous. *Seed* 1, testa pergamaceous; albumen none; cotyledons fleshy, ·55 in. long; radicle very small, superior. *Olea* (?) *pauciflora*, Wall. Cat. 2812; A.DC. Prod. VIII. 288. *Chionanthus palembanica*, Miq. Fl. Ind. Bat. Suppl. 558; Kurz For. Fl. II. 159, and Journ. As. Soc. Beng. XLVI. ii. 243.

KEDAH: *Curtis.* PENANG: *Wallich* 2812A, B; *G. King; Curtis* 695, 2773; *King's Collector* 1693; *Ridley* 10178. PERAK: *Ridley* 7160; *Scortechini* 952; *King's Collector* 4172, 4834. SINGAPORE: *Ridley* 5079. —DISTRIB. Tenasserim, Andamans, Borneo (*Haviland* 1766).

2. LINOCIERA MACROCARPA, King & Gamble. A small tree; branchlets pale greyish-brown, stout, lenticellate; innovations ashy-pubescent. *Leaves* coriaceous; obovate-oblong or obovate-lanceolate, obtuse or very shortly and bluntly acuminate at apex, long cuneate at base; glabrous on both surfaces; margins entire or slightly recurved; 6 to 10 in. long, 2 to 3·5 in. broad; midrib very stout, broad and plane above, much raised beneath; main-nerves 14 to 17 pairs, prominent beneath, curved only near the margin to meet in a faint looped intramarginal nerve; secondary nerves and reticulations obscure; petiole 1 to 1·5 in. long, enlarged at base. *Flowers* in ashy-pubescent panicles, 2 to 4 in. long; bracts leafy, sometimes oblong-lanceolate, more generally spathulate; bracteoles linear-subulate, short; pedicels variable, often 0; rachis and pedicels much enlarged in fruit. *Calyx* pubescent; tube short; lobes ovate-acute, ·05 in. long. *Corolla-tube* very short; lobes oblong-linear, ·1 to ·15 in. long, margins much incurved. *Stamens* ·075 in. long; anthers oblong; filaments very short,

connective produced in a conical acumen. *Ovary* pubescent; style short; stigma 2-lobed. *Drupe* oblong-ellipsoid, 1·7 in. long, 1 to 1·2 in. broad; exocarp thick, granular; endocarp hard, ·15 in. thick, obscurely ridged outside. *Seed* 1, testa membranous, albumen fleshy. *L. insignis*, Clarke in Hook. f. Fl. Br. Ind. III. 610. *Chionanthus macrocarpa*, Blume Mus. Bot. I. 319 (1849); Koord. & Val. Bijdr. VIII. 239. *C. insignis*, Miq. Fl. Ind. Bat. Suppl. 559 (1862). *C. montanus*, Kurz in Journ. As. Soc. Beng. XLVI. ii. 243, and For. Fl. II. 159.

SINGAPORE: at Bukit Mandai, *Ridley* 4580.—DISTRIB. Tenasserim (*Helfer* (K.D.) 3688), Martaban (*Kurz*), Sumatra (*Teysmann*, *Beccari* 826), Borneo (*Beccari* 725).

3. LINOCIERA PALUDOSA, King & Gamble, n. sp. A small tree (*Wray*), large tree, 60 to 80 feet high, and 15 to 20 in. in diam. of stem (*King's Collector*); branchlets thick, pale greyish-brown. *Leaves* coriaceous; oblong, bluntly acute at apex, also at base; glabrous on both surfaces except on the nerves which are minutely pubescent; margins recurved; 6 to 12 in. long, 2 to 4 in. broad; midrib thick, prominent, slightly raised above, strongly so beneath main-nerves 11 to 15 pairs, impressed above, prominently raised beneath, ·75 to 1 in. apart, at first straight then curving upwards to and along the margin to anastomose and form a prominent looped intramarginal nerve; secondary nerves few; reticulations transverse, not prominent; petiole stout, wrinkled, ·5 in. long. *Flowers* yellow, with a brown centre, in pubescent panicles 1·5 to 2 in. long from the branchlets between the leaf-nodes in the axils of small tubercles; peduncles stout, grey-pubescent, ·2 in. long; bracts ovate, grey-pubescent; bracteoles ovate-acute, recurved; pedicels 0·5 in. long. *Calyx-tube* short, lobes ovate-acute or triangular, ciliate, ·025 in. long, one lobe sometimes enlarged. *Corolla-lobes* in 2 pairs, linear-oblong, obtuse, ·2 in. long, ·05 in. broad, glabrous. *Stamens* ·05 in. long; filaments broad, short; anthers rounded, connective with an obscure gland. *Ovary* conical, glabrous; style short; stigmas 2. *Fruit* not known.

PERAK: at Sungie Larút, *Wray* 2424; on low wet ground, *King's Collector* 6476.

4. LINOCIERA CAUDATA, King & Gamble, n. sp. A tree, reaching 30 to 40 feet in height and 5 to 7 in. in diam. of stem; branches slender, pale grey, ultimate branchlets darker. *Leaves* chartaceous; lanceolate, caudate-acuminate at apex, cuneate at base; glabrous on both surfaces; margins entire, recurved; 3 to 4 in. long, 1 to 1·25 in. broad; midrib slender, raised above, scarcely raised beneath; main-nerves very obscure, about 4 to 5 pairs, curving sharply upwards to meet in an intramarginal looped nerve; petiole ·1 to ·2 in. long, grooved above.

Flowers in axillary or extra-axillary, few-flowered, trichotomous, paniculate cymes about 1 in. long; rachis glabrous, somewhat angular; bracts and bracteoles small, ovate, acute. *Calyx* ·05 in. long, tube short; lobes 4, ovate, obtuse. *Corolla-tube* scarcely any; lobes in 2 pairs, oblong; ·1 in. long. *Stamens:* filaments broad; anthers oblong, cells extrorsely dehiscing; connective apiculate. *Ovary* glabrous, conical; style very short; stigma bifid. *Drupe* (immature) obovoid, ·3 to ·4 in. long, seed apparently albuminous.

PERAK: *King's Collector* 3212, 6857, in dense jungle on high mountains at 3,500 to 4,000 feet.

This species is rather near *L. monticola*, Bl., but the leaves are narrower and the inflorescence longer.

4. OLEA, Linn.

Trees or shrubs. *Leaves* opposite, entire or toothed. *Flowers* small; hermaphrodite, diœcious or polygamous; in axillary, rarely terminal trichotomous panicles; bracts small. *Calyx* short, 4-toothed or -lobed. *Corolla-tube* short; lobes 4, induplicate-valvate, sometimes 0. *Stamens* 2, on the corolla-tube or sub-hypogynous; filaments short; anthers ovate or oblong, cells dehiscing on the margin or slightly extrorse, in ♂ flowers sometimes introrse. *Ovary* 2-celled; ovules 2 in each cell, attached laterally to the septum or sub-pendulous; style short; stigma obtuse, capitate or bifid. *Drupe* ellipsoid or sub-globose; exocarp fleshy; endocarp bony or crustaceous, usually 1-seeded. *Seed* pendulous; testa thin; albumen fleshy, sometimes slightly ruminate; cotyledons flat, radicle superior.—DISTRIB. South Europe and Asia, tropical and South Africa, New Zealand; about 35 species.

Inflorescence more than 3 in. long; leaves oblong lanceolate, acute, usually over 4 in. in length	1. *O. dentata.*
Inflorescence under 3 in. long; leaves elliptic-lanceolate, acuminate, under 4 in. in length	2. *O. maritima.*

SPECIES IMPERFECTLY KNOWN.

Leaves 8 to 14 in. long; inflorescence extra-axillary on old wood; drupes flattened	3. *O. platycarpa.*
Leaves 2 to 3 in. long; inflorescence axillary or extra-axillary on young wood; corolla-lobes linear, ·1 in. long; drupes not known..	4. *O. ardisioides.*

1. OLEA DENTATA, Wall. Cat. 2840 (1829). A tree, 40 to 60 feet high; branchlets light brown, smooth, innovations minutely pubescent. *Leaves* coriaceous; oblong-lanceolate, bluntly acute at apex, cuneate or rounded at base; glabrous on both surfaces, but when young pubescent on the nerves beneath; margins entire or distantly dentate, slightly recurved; 3·5 to 5·5 in. long, 1 to 2 in. broad; midrib slender, im-

pressed above, raised beneath; main-nerves obscure, 8 to 10 pairs, arching upwards to join in a looped nerve near the margin, impressed above; petiole ·4 in. long. *Flowers* in axillary or extra-axillary, leafy, tri-pinnate, minutely pubescent, paniculate cymes, 3 to 6 in. long, branches trichotomous, ultimate cymes umbellate; bracts leafy, oblong or lanceolate, ·5 to 1·5 in. long; pedicels slender, ·05 to ·1 in. long; bracteoles minute, ovate-acute. *Calyx* minutely pubescent, ·05 in. long; lobes 4, ovate, obtuse. *Corolla* tubular-campanulate, ·15 in. long; lobes 4, rounded, ·05 in. long. *Stamens* very small, inserted at the base of the corolla-tube; filaments very short; anthers ovoid, sub-extrorsely dehiscent. *Ovary* ovoid; style none; stigma capitate; cells 2, ovules 2 in each cell. *Drupe* not seen. A.DC. Prod. VIII. 286; Kurz in Journ. As. Soc. Beng. XLVI. ii. 245, and For. Fl. II. 157; Clarke in Hook. f. Fl. Br. Ind. III. 613.

PENANG: *Curtis* 222, 950, 2267.—DISTRIB. Burma.

2. **OLEA MARITIMA**, Wall. Cat. 2813 (1829). A large shrub or small tree; branchlets terete, pale brown; innovations minutely pubescent. *Leaves* coriaceous; elliptic-lanceolate, acuminate at apex, cuneate or somewhat rounded at base; glabrous on both surfaces; margins entire or distantly serrate on their upper half; 3 to 4 in. long, 1 to 2 in. broad; midrib slender, impressed above, raised beneath; main-nerves obscure, 7 to 10 pairs, meeting near the margin in a looped intramarginal nerve; reticulations scanty; petiole ·2 to ·3 in. long, minutely pubescent when young, finally glabrous. *Flowers* dull white, polygamous, in slender, minutely pubescent, trichotomous paniculate cymes with few branches; ultimate cymes umbellate, usually ·75 to 1 in. long in flower, up to 1·5 in. long in fruit, rarely axillary, usually extra-axillary; each pair of peduncles supported by a pair of ovate lanceolate leafy bracts ·3 to ·5 in. long; common peduncles ·7 in. long; pedicels ·05 to ·1 in. long, bracteoles none. *Calyx* ·05 in. long, minutely rusty-pubescent; tube short; lobes 4, ovate-acute, as long as tube. *Corolla* campanulate, ·1 to ·15 in. long; lobes 4, obtuse, as long as tube, induplicate-valvate, apparently absent in ♀. *Stamens* ·07 in. long, inserted near the base of the corolla-tube; filaments slender; anthers as long as filaments, reniform, cells sub-extrorsely dehiscing. *Ovary* conical; style none; stigma capitate; cells 2, ovules in each cell pendulous. *Drupe* globose, ·2 in. in diam., black when ripe, wrinkled when dry; exocarp thin, fleshy, endocarp crustaceous. *Seed* 1, testa very thin, albumen copious; cotyledons elliptic, nearly ·1 in. long; radicle somewhat thick. G. Don Gen. Syst. IV. 49; A.DC. Prod. VIII. 288; 288; Clarke in Hook. f. Fl. Br. Ind. III. 612; Miq. Fl. Ind. Bat. II. 547.

MALACCA: *Griffith* (K.D.) 3679; *Maingay* (K.D.) 1022; *Cuming* 2318; *Ridley* 3284, 10731. PAHANG: a common bush on the sandy heaths, *Ridley* in Trans. Linn. Soc. Ser. 2. III. 319. SINGAPORE: *Wallich* 2813; *Walker* 183; *Ridley* 3616A, 8420; *King's Collector* 1138; *Murton* 62.—DISTRIB. Malay Islands.

SPECIES IMPERFECTLY KNOWN.

3. OLEA PLATYCARPA, King & Gamble, n. sp. A small tree with spreading branches, reaching 25 to 30 feet in height; branchlets stout, pale brown, smooth, marked by the prominent horse-shoe-shaped scars of fallen leaves. *Leaves* coriaceous; obovate-oblong or oblong-lanceolate, abruptly acuminate at apex, cuneate at base; glabrous on both surfaces and with scattered glands; margins entire, slightly recurved; 8 to 14 in. long, 3 to 5 in. broad; midrib very stout and prominent; main-nerves 14 to 16 pairs, curving upwards to join in a looped intramarginal nerve close to the margin; secondary nerves few; reticulations irregular, obscure; petiole 1 in. long, base enlarged, wrinkled. *Flowers* diœcious, in extra-axillary, sessile, paniculate, trichotomous cymes, usually on old wood, 1 to 1·5 in. long, supported by a cluster of sheathing scarious bracts; bracts of panicle branches and bracteoles ovate-acute; pedicels very short, stout, somewhat angular. *Calyx* short, ·05 in. long; teeth (in ♀ flowers) ovate, obtuse, ciliate. *Corolla* none in ♀, ♂ not seen. *Ovary* conical, rugose; style 0; stigma 2-lobed, mitriform. *Drupe* ovate-oblong, flattened, ·7 in. long, ·5 in. broad; exocarp thick, wrinkled when dry; endocarp thick, granular; cells 2. *Seed* 1, pendulous from the summit of the thin central persistent septum; testa membranous; albumen thick, fleshy; cotyledons ovoid, ·15 in. long, radicle rather stout.

PERAK: at low levels on the hills, *King's Collector* 5541, 7649; *Hervey*.

The absence of male flowers renders the identification of the genus of this plant somewhat uncertain, but we consider it belongs rightly to *Olea*.

4. OLEA ARDISIOIDES, King & Gamble, n. sp. A small tree; branches slender, terete, with yellowish bark; branchlets minutely pubescent. *Leaves* coriaceous; lanceolate, long acuminate at apex, cuneate at base; glabrous on both surfaces; margins entire, recurved; 2 to 3 in. long, ·6 to ·1 in. broad; midrib slender, impressed above, raised beneath; main-nerves 5 pairs, curving upwards to meet in a looped intramarginal nerve, obscure; secondary nerves and reticulations very obscure; petiole slender, ·1 to ·2 in. long. *Flowers* in axillary or extra-axillary

slender paniculate cymes, 1 to 2 in. long; rachis somewhat angular, minutely pubescent; bracts leafy, lanceolate, ·5 to 1 in. long; bracteoles similar or sometimes subulate-spathulate; pedicels slender, ·1 in. long, reflexed. *Calyx-tube* very short; lobes 4, ovate-acute, ·025 in. long, ciliate. *Corolla-tube* ·03 to ·05 in. long; lobes 4, induplicate-valvate, linear, ·1 in. long. *Stamens* 2, inserted at the base of the corolla-tube, ·05 in. long; filaments slender; anthers elliptic, cells dehiscing laterally, connective mucronate. *Ovary* conical; style 0; stigma minute, bifid; cells 2. *Fruit* not seen.

PERAK: on Gunong Bubu, 5,000 feet, *Wray* 3871. PAHANG: *Barnes* 10896.

We have hesitated whether to describe this species as *Olea* or *Linociera*, for the corolla-tube is not very long, and the lobes are like those of the latter genus, but the character of the leaves is distinctly that of *Olea*.

5. MYXOPYRUM, Blume.

Large scandent shrubs with quadrangular branches. *Leaves* opposite, large, triplinerved, entire or denticulate. *Flowers* small, yellow, very numerous, in axillary and terminal trichotomous panicles. *Calyx-tube* short, lobes 4. *Corolla* fleshy; tube urceolate; lobes 4, concave, induplicate-valvate in bud. *Stamens* 2, inserted on the base of the corolla-tube; filaments very short; anthers rather large, ovate, cells dehiscing laterally. *Ovary* 2-celled; style very short or 0, stigma 2-lobed; ovules 1 to 2 in each cell, attached near the base at the inner angle. *Fruit* a 1–2-seeded sub-globose berry; pericarp crustaceous. *Seeds* 1 to 4, erect, testa membranous, albumen thick; cotyledons flat, ovate, radicle inferior.—DISTRIB. India and Malaya, 3 species.

MYXOPYRUM NERVOSUM, Blume Bijdr. 683 (1826). A large climbing shrub; branches with fibrous pale brown bark; branchlets prominently quadrangular. *Leaves* coriaceous; elliptic or elliptic-oblong or elliptic-lanceolate, acuminate at apex, cuneate or rounded at base; glabrous on both surfaces; margins entire or denticulate in the upper half, prominently recurved; 4 to 7 in. long, 1·5 to 3·5 in. broad; midrib thick, prominent beneath, impressed above; main-nerves 4 to 6 pairs, the lowest pair opposite, very prominent, starting a little above the base and forming an intramarginal nerve looped only after where it meets the rest at about two-thirds of the way up, the next pair not opposite and only starting from about half the length of the leaf; secondary nerves few, reticulations irregular, prominent in dry specimens; petiole ·3 to ·5 in. long, often twisted, channelled above, articulate at the base. *Flowers* sessile, in terminal or axillary or extra-axillary, trichotomous, minutely pubescent panicles, 1·5 to 3 in. long; rachis angular, swollen at the nodes; bracts subulate, recurved, ·1 in. long; bracteoles triangular, minute. *Calyx-tube* very short; lobes 4, triangular, acuminate. *Corolla* yellowish- or greenish-white, fleshy; tube urceolate, ·05 to ·1 in. long; lobes oblong, incurved, ·05 in. long, induplicate-valvate in bud. *Stamens* 2, inserted on the tube of the corolla; filaments very short, broad; anthers ovate, rather large. *Ovary* ovoid; style 0; stigma 2-lobed; cells 2, ovules 2 in each cell, erect from a minute basal central placenta. *Berry* ovoid or globose, ·5 to ·7 in. in diam., rough, surmounted by the persistent stigma, blueish-black when ripe; cells 2. *Seeds* 2 to 4, erect on an enlarged placenta at the base of the central dissepiment; albumen fleshy, testa membranous. Mus. Bot. Lugd. Bat. I. 320, t. 51; A.DC. Prod. VIII. 290; Miq. Fl. Ind. Bat. II. 549; Clarke in Hook. f. Fl. Br. Ind. III. 618.

PENANG: *Curtis* 2849. PERAK: *Wray* 2139, 2834, 4179; *Scortechini* 532, 598*b*; *King's Collector* 3584, 4544, 7392, 8845. MALACCA: *Maingay* (K.D.) 996/3—DISTRIB. Sumatra (*Forbes* 1585, in the Lampongs); Java.

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Materials for a Flora of the Malayan Peninsula.—By Sir George King, K.C.I.E., LL.D., F.R.S., *late Superintendent of the Royal Botanic Garden, Calcutta, and* J. Sykes Gamble, C.I.E., F.R.S., *late of the Indian Forest Department.*

No. 18.

This part contains nine Natural Orders, viz., Nos. 79 *Hydrophyllaceæ* to 85 *Lentibulariaceæ* inclusive, as well as Nos. 87 *Bignoniaceæ* and 88 *Pedalineæ*. The whole part is the work of Lieut.-Col. D. Prain, I.M.S., F.R.S., Superintendent of the Royal Botanic Garden, Calcutta, with the exception of *Boragineæ*, which has been done by Sir George King, and *Hydrophyllaceæ* and *Bignoniaceæ*, which have been done by Mr. Gamble.

The nine Orders dealt with contain 53 genera and 150 species: of the species none are here described for the first time.

Natural Order No. 86 *Gesneraceæ* will follow later on with the three Orders, 75 *Apocynaceæ*, 76 *Asclepiadaceæ*, and 77 *Loganiaceæ*, the preparation of which is not yet quite complete.

Order LXXIX. HYDROPHYLLACEÆ.

Annual or perennial herbaceous plants. *Leaves* radical or alternate, rarely opposite, entire or dentate, simple or pinnately or palmately lobed. *Flowers* usually unilaterally sub-sessile on the branches of a bifid or dichotomous scorpioid cyme, or else pedunculate in the axils or on the summits of the branches; regular, hermaphrodite. *Calyx* inferior, with 5 or occasionally many equal imbricate lobes. *Corolla* gamopetalous, funnel-shaped cup-shaped campanulate or rotate; lobes 5, rarely many, imbricate or sometimes twisted. *Stamens* as many as the corolla-lobes, alternate with them, usually fixed to the base of the tube, exsert or included; filaments filiform, sometimes dilated or appendiculate at base; anthers ovate, oblong or linear, dorsifixed; cells 2, parallel, dehiscing introrsely with longitudinal clefts. *Ovary* superior, sometimes unilocular, with 2 free or parietal placentas, sometimes more or less completely 2-celled with fleshy placentas adnate to the septum; styles either 1 filiform bifid or undivided, or 2 distinct from the base; stigmas terminal, small or capitate; ovules 2 to many in each cell. *Capsule* loculicidally, sometimes septicidally, bi-valved, the placentas if parietal attached to the valves, if central remaining free. *Seeds* usually oblong, globose or angular, 2 to many on each placenta; testa reticulate or wrinkled, rarely smooth; albumen fleshy, embryo small, erect; cotyledons plano-convex or semi-terete.—DISTRIB. About 150 species, chiefly American, very few in the Old World.

HYDROLEA, Linn.

Herbs or undershrubs. *Leaves* entire, alternate. *Flowers* blue, in short terminal cymes or racemes. *Calyx* divided nearly to the base, segments lanceolate. *Corolla* widely campanulate, sub-rotate, lobes imbricate. *Stamens* 5, attached to the corolla-tube; filaments filiform, sometimes dilated at base; anthers sagittate. *Ovary* completely 2-celled, with fleshy placentas adnate to the dissepiment; styles 2, rarely 3, distinct, filiform; stigmas capitellate; ovules many in each cell, multi-seriate. *Capsule* globose or ovoid, septicidal, usually 2-, rarely 3- or 4-valved. *Seeds* minute, irregularly wrinkled.—DISTRIB. About 14 species, chiefly American, with one Chinese, one of tropical Africa, and one of India and Malaya.

HYDROLEA ZEYLANICA, Vahl Symb. II. 46 (1791). An annual herb; stems nearly glabrous below, glandular pubescent above, soft, somewhat succulent, often rooting, always straggling. *Leaves* membranous; lanceolate or oblong-lanceolate, attenuate above and below; ·5 to 2 in. long, ·2 to ·5 in. broad; glabrous or slightly pubescent; petiole none or very short and winged by the decurrent blade. *Flowers* in racemes on short lateral leafy branches. *Calyx-lobes* acute, glandular-pubescent, 3-nerved, about ·3 in. long. *Corolla-lobes* ovate, ·2 in. long, many-nerved, blue. *Stamens* with sagittate, often twisted anthers, and filaments dilated at base. *Capsule* shorter than the calyx-lobes, ovoid, 2-lobed; placentas central, adherent at their backs to the dissepiment. *Seeds* very many, oblong, obtuse, testa very faintly wrinkled. Lamk Ill. t. 184; Wall. Cat. 4398; W. & A. in Hook. Comp. Bot. Mag. II. 193, t. 26; Wight Ill. t. 167, and Ic. t. 601; Choisy in DC. Prod. X. 180; Dalz. & Gibs. Bomb. Fl. 170; Miq. Fl. Ind. Bat. II. 633; Clarke in Hook. f. Fl. Br. Ind. IV. 133; Trimen Fl. Ceyl. III. 191. Cooke Bomb. Fl. II. 197; Prain Beng. Plants 711. *H. javanica*, Blume Bijdr. 725. *Nama zeylanica*, Linn. Sp. Pl. 226; Roxb. Fl. Ind. II. 73. "Tsjeru Vallel," Rheede Hort. Mal. X. t. 28.

PERAK: *Wray* 2571, 3336; *Scortechini*; *Ridley* 2906; *King's Collector* 391, 2577.—DISTRIB. Throughout India, Ceylon, Burma, Siam, Java, Malaya, China, the Philippines; also in Australia, tropical Africa and America, in wet places and rice-fields.

Order LXXX. BORAGINEÆ.

Herbs, shrubs, or trees, often conspicuously hispid or scabrous. *Leaves* alternate, very rarely opposite, ex-stipulate, usually entire, rarely in verticils. *Flowers* usually in scorpioid dichotomous cymes, sometimes trichotomously paniculate, rarely solitary and axillary, bracteate or not, hermaphrodite. *Calyx* inferior, 5-lobed (rarely 6- to 8-lobed), the lobes imbricate, rarely valvate, usually persistent in fruit. *Corolla* gamopetalous, of various forms, often with scales in the throat; the limb 5-lobed (rarely 4- to 6-lobed), the lobes imbricate, rarely twisted. *Stamens* as many as the lobes and alternate with them, inserted on the tube; anthers ovate to linear, introrse; filaments slender, often dilated at the base. *Disk* under the ovary or obsolete. *Ovary* superior, sessile, cells 2 with 2 ovules in each, or 4 with 1 ovule in each; style terminal or from the depression between the lobes of the ovary, long or short; stigma entire and capitate or 2-lobed, the style rarely twice bifid; ovules sub-erect from the basal angle of the cell. *Fruit* drupaceous with a hard 2- to 4-celled endocarp or dividing into 2 or 4 nutlets with thin or fleshy walls. *Seeds* erect or oblique, with membranous testa and fleshy albumen or ex-albuminous; embryo curved or straight, radicle superior.—DISTRIB. Universal. Species about 1,500.

Styles twice partite; drupe 4-1-seeded; trees or shrubs; calyx enlarging in fruit .. .. 1. CORDIA.

Styles simple or only bi-partite; rarely (*Coldenia*) 2 or more and distinct; drupe including two 2-seeded or four 1-seeded pyrenes; calyx only slightly or not at all enlarged in fruit:—

Styles depressed-conical at the apex or with a horizontal ring below or at the stigmas:—

  Styles short, shortly 2-lobed; pyrenes two 2-seeded; herbs or shrubs .. .. 2. TOURNEFORTIA.
  Styles elongated, dilated at the apex; pyrenes four 1-seeded, much resembling nutlets; herbs .. .. .. 3. HELIOTROPIUM.
Styles elongated, not dilated or annular at the apex, more or less bi-partite :—
  Styles 2-fid at the apex; pyrenes two 2-seeded, or four 1-seeded; trees or shrubs .. .. 4. EHRETIA.
  Styles more or less separate, distinct at base and apex, united but easily separable in the middle; pyrenes four 1-seeded, much resembling nutlets; prostrate herbs .. 5. COLDENIA.

1. CORDIA, Linn.

Trees or shrubs. *Leaves* alternate, rarely sub-opposite, petiolate. *Flowers* in dichotomous cymes with scorpioid branches, or corymbose or in clusters, ebracteate, polygamous, the ⚥ fewer than the ♂. *Calyx* tubular or campanulate, usually with short and often irregular teeth, accrescent in fruit. *Corolla* funnel- or salver-shaped or campanulate; the lobes of the limb 4 to 8, spreading or recurved, white or orange. *Stamens* as many as the lobes; anthers sagittate or hastate, shortly exserted; filaments often hairy near the base. *Ovary* 4-celled, glabrous; style terminal, long, bi-partite, the branches again bifid, linear or sub-spathulate, cells of ovary 1-ovuled. *Fruit* ovoid or ellipsoid, surrounded by the enlarged calyx; the putamen bony, with 1 to 4 cells, but one only with a fertile seed. *Seed* exalbuminous, the cotyledons large and fleshy or thin but always plicate.—DISTRIB. About 280 species, all tropical.

Flowers about 1·5 in. long .. .. 1. *C. subcordata.*
Flowers less than ·5 in. long :—
  Leaves broadly ovate, sub-acute or obtuse, the base often cordate 2. *C. Myxa.*
  Leaves ovate-lanceolate, acuminate, the base cuneate .. 3. *C. Griffithii.*

1. CORDIA SUBCORDATA, Lamk Ill. 1899 (1792). A small tree; young branches as thick as a goose-quill, glabrous, pale brown when dry. *Leaves* membranous; broadly ovate or ovate-rotund, the apex acute, the base broadly rounded or sub-cordate; both surfaces brown when dry, the lower paler, harshly and minutely reticulate; main-nerves 4 or 5 pairs, faint on both surfaces when dry; length 3·5 to 6·5 in., breadth 2·5 to 4 in.; petiole 1·25 to 2 in. *Corymbs* lateral, few-flowered, shorter than the leaves, glaberulous; pedicels ·25 in. long. *Calyx* cylindric, slightly widening towards the mouth, ·4 in. long and nearly ·2 in. wide at the middle, glabrous; the limb with 3 broad triangular teeth. *Corolla* about 1·3 in. long, orange or reddish, funnel-shaped; lobes about 6, broad, spreading, as long as the tube. *Stamens* 6.

Stigma with linear-spathulate branches. *Fruit* very bony, pyramidal, its apex acute, with 4 bold angles, the spaces between the angles often with large tubercles, 1 in. long and as much in breadth from angle to angle, usually with 1 or more seeds; entirely enveloped in the much-inflated glabrous accrescent apiculate calyx. Wall. Cat. 9063; DC. Prod. IX. 477; Seem. Fl. Viti, t. 34; Benth. Fl. Austral. IV. 385; Kurz For. Fl. Burm. II. 209; Clarke in Hook. fil. Fl. Br. Ind. IV. 140; Miq. Fl. Ind. Bat. II. 914. *C. orientalis*, R. Br. Prod. 498. *C. campanulata*, Roxb. Fl. Ind., ed. Carey & Wall. II. 336. *C. Rumphii*, Blume Bijdr. 843. *C. hexandra*, Roem. & Schult. Syst. IV. 799. Rumph. Herb. Amb. II. t. 75.

PERAK: *Scortechini* 1084. DINDINGS: *Curtis* 3447. KEDAH: *Ridley* 5526. PAHANG: *Ridley* 2158.—DISTRIB. British India, Malay Archipelago, Australia, Sandwich Islands. Widely cultivated in other places.

2. CORDIA MYXA, Linn. Sp. Pl. 190 (1753). A tree, 40 to 50 feet high; young branches thinner than a goose-quill, glabrous. *Leaves* thinly coriaceous; broadly ovate, apex sub-acute or obtuse, the base slightly cordate; upper surface when dry dark brown, glabrous, faintly reticulate; the lower paler brown, distinctly and minutely reticulate, the transverse veins very prominent, glabrous except for some pubescence on the midrib and 5 or 6 pairs of curved ascending main-nerves; length 3 to 3·75 in., breadth 2 to 2·75 in.; petioles ·75 to 1·25 in. *Cymes* trichotomous, shorter than the leaves, terminal. *Male and female* flowers often in the same tree, mostly 5-merous. *Calyx* campanulate, more than ·25 in. long, glabrous, smooth outside, silky inside. *Corolla* with its tube included in the calyx; the lobes projecting and ·15 in. long, reflexed; style in the ♀ flowers short, 4-cleft, absent in the ♂. *Fruit* ellipsoid, with acute apex and rounded base, compressed, with 3 or 4 angles (one or more of them indistinct), ·75 in. long and ·4 in. broad, 2- or more-seeded; the persistent accrescent calyx leathery with strong vertical reticulations, widely campanulate, its mouth with shallow irregular crenations, length ·25 in., width ·4 to ·5 in. DC. Prod. IX. 479; Delile Fl. Ægypt. t. 19, fig. 1; Roxb. Fl. Ind., ed. Carey & Wall., II. 232; Wall. Cat. 889; Wight Ill. t. 169; Benth. Fl. Austral. IV. 386; Bedd. Fl. Sylv. t. 245, fig. A; Brandis For. Fl. 336 (*in part*); Kurz For. Fl. Burm. II. 208; Boiss. Fl. Or. IV. 124; Miq. Fl. Ind. Bat. II. 915; Clarke in Hook. fil. Fl. Br. Ind. IV. 136; Trimen Fl. Ceyl. III. 193; Cooke Fl. Bomb. II. 199; Prain Beng. Plants 714. *C. Myxa*, var. *b. minor only*, Thw. Enum. Pl. Zeyl. 214. *C. indica*, Lamk Dict. VII. 49; DC. Prod. IX. 500. *C. officinalis* and *C. africana*, Lamk Ill. II. 420, and t. 96, fig. 3. *C. Sesbestena*, Forsk. Fl. Aeg.-Arab. LXIII. *C. paniculata*, Roth Nov. Spec. 124; DC. Prod.

IX. 482. *Sebestena officinalis*, Gaertn. Fruct. I. 364, t. 76. *Ehretia glabra*, Roth Nov. Spec. 127; DC. Prod. IX. 510. *Beurreria glabra*, G. Don Gen. Syst. 390.

MALACCA and SINGAPORE: probably introduced.—DISTRIB. Tropics of the Old World.

3. CORDIA GRIFFITHII, Clarke in Hook. fil. Fl. Br. Ind. IV. 139 (1883). A small tree; young branches about as thick as a crow-quill, puberulous, pale and angled when dry. *Leaves* thinly coriaceous; ovate-lanceolate, acute or acuminate, the base slightly cuneate; both surfaces brown when dry (the lower the paler), minutely reticulate, glabrous; main-nerves 3 or 4 pairs, curved, ascending; length 1·5 to 3·5 in., breadth 1 to 1·75 in.; petioles ·65 to 1·25 in. *Cymes* slender, 2·5 to 4 in. long (including their peduncles), dichotomous, lax, few-flowered, puberulous. *Flowers* ·4 in. long, almost sessile. *Calyx* ·25 in. long, funnel-shaped; the mouth wide, oblique, and with 5 irregular short teeth. *Corolla* funnel-shaped, much longer than the calyx; the limb longer than the tube, deeply divided into 5 narrowly elliptic reflexed lobes. *Stamens* 5, attached to the throat of the tube; anthers oblong, exserted; filaments unequal in length, flattened below. *Ovary* obovoid, smooth, 4-celled, ovules solitary in each cell; style thin and cylindric above, swollen in its lower half, exserted.

MALACCA: *Griffith* (K.D.) 5997; *Maingay* (K.D.) 1162; *Ridley* 4561. SELANGOR: *Ridley* 7373. KEDAH: *King's Collector* 1742.

2. TOURNEFORTIA, Linn.

Trees or shrubs, sometimes almost herbs, and often sub-scandent. *Leaves* alternate, entire. *Cymes* scorpioid, dichotomous, usually terminal, rarely lateral or extra-axillary. *Flowers* small, numerous, crowded, sessile or on short pedicels, ebracteate. *Calyx* deeply 4- or 5-partite, the segments ovate or lanceolate. *Corolla* white or greenish; the tube cylindric, naked in the throat; the lobes of the limb 5 or 4, small, spreading. *Stamens* 5 or 4, included in the tube; anthers oblong-ovate or lanceolate, apiculate or not; filaments short. *Ovary* 4-celled; style terminal, short, 2-lobed (in the Indo-Malayan species); ovules 1 in each cell, pendulous from the upper inner part of the cell. *Drupe* small, ovoid, slightly fleshy or leathery, indistinctly separating into two 2-seeded or into four 1-seeded pyrenes. *Seeds* straight or curved, pendulous, albuminous; embryo straight or curved.—DISTRIB. About 130 species, in the tropics of both hemispheres.

TOURNEFORTIA WALLICHII, DC. Prod. IX. 527 (1845). A climber, 10 to 30 feet long; young branches terete, twice as thick as a crow's-quill, minutely rusty-puberulous, becoming glabrous. *Leaves* thickly membranous; ovate, the apex acute or shortly acuminate, the base rounded, slightly oblique; both surfaces when dry brown, the upper quite glabrous, the lower paler, reticulate, sometimes with a few small hairs on the nerves; main-nerves 4 or 5 pairs, curved, ascending, depressed like the midrib on the upper surface, prominent on the lower; length 2 to 3·5 in., breadth ·75 to 1·75 in.; petioles ·3 to ·4 in. *Cymes* terminal and lateral (extra-axillary), on long peduncles, dichotomously branched, sub-glabrous. *Flowers* ·3 to ·4 in. long, sessile, forming crowded one-sided pseudo-spikes (scorpioid cymes) on the terminal inch or two of the branches of the cymes. *Calyx* about ·05 in. long, only about a sixth or a seventh as long as the corolla, cleft nearly to the base into 4 broadly triangular acute spreading segments. *Corolla-tube* 4-angled; the limb short, with 4 ovate teeth, glabrous. *Anthers* 4, oblong, sessile or nearly so, near the throat. *Fruit* broadly ovoid, ·15 to ·2 in. long, with 4 vertical grooves (2 of them deep) on the sides, and a depression on the apex. Clarke in Hook. fil. Fl. Br. Ind. IV. 147. *T. tetrandra*, Wall. Cat. 911 (*not of* Blume). *Tetrandra Wallichii*, Miq. Fl. Ind. Bat. II. 928.

SINGAPORE: *Maingay* (K.D.) 1165, 8041; *King's Collector* 302. PERAK: *Wray* 3536; *Ridley* 2431; *King's Collector* 3335, 5158 *Scortechini* 1494.—DISTRIB. Java, Sumatra.

3. HELIOTROPIUM, Linn.

Annual or perennial herbs, very hairy or scabrous. *Leaves* alternate. *Flowers* small, white, or pale purple, sometimes in terminal dichotomous cymes with scorpioid branches and small or no bracts, sometimes axillary in the axils of large bracts. *Calyx* divided into 5 linear or lanceolate segments. *Corolla* with a cylindric tube and limb of various shapes, the lobes of the latter always imbricate or induplicate in bud, spreading in flower. *Stamens* 5, included, inserted on the tube by short filaments; anthers ovate-oblong or lanceolate. *Ovary* completely or imperfectly 4-celled, 4-ovulate; style short or long, terminal, with a depressed conical or flat disk on its apex; stigma above the disk, none or short or elongate, entire or rarely bifid. *Fruit* dry, 2- to 4-grooved or -lobed, and consisting of 4 nutlets free from the beginning or finally becoming so. *Seeds* straight or curved; albumen none, small or large; cotyledons plano-convex.—DISTRIB. Species about 225, widely distributed in both hemispheres.

Leaves ovate-lanceolate, 1·5 to 2·5 in. long .. .. .. 1. *H. indicum.*
Leaves linear, ·5 to 1 in. long .. .. 2. *H. strigosum.*

1. HELIOTROPIUM INDICUM, Linn. Sp. Pl. 130 (1753). Herbaceous,

but woody at the base, a foot or two in height, with few branches; the branches, lower parts of the inflorescence, and the petioles with white stiff hairs. *Leaves* membranous, greenish-brown when dry; ovate or ovate-lanceolate, slightly inequilateral, the apex usually acute, the base rounded, irregularly cordate, often unequally so; both surfaces with some scattered long white hairs; the lower surface pale and faintly reticulate when dry; main-nerves 6 to 8 pairs, rather straight, ascending, slightly prominent on the lower surface; length 1·5 to 2·5 in., breadth ·75 to 2 in.; petioles ·4 to 1·5 in. *Cymes* scorpioid, terminal and lateral (extra-axillary), about 2 in. long (lengthening with age to 5 or 6 in.), on peduncles about 1 in. long; the rachises hispid, compressed when dry. *Flowers* about ·15 in. long, sessile, numerous. *Calyx* about ·05 in. long, deeply divided into 5 narrowly lanceolate sub-erect hispid segments. *Corolla* tubular, slightly dilated at the base; the limb with 5 broad blunt reflexed lobes; anthers 5, included, inserted about the middle of the tube. *Fruit* ·1 in. long, conical, with an apical beak and with 4 bold vertical ridges and 4 faint ones, glabrous naturally separating into 2 halves, each half consisting of 2 cohering pyriform pyrenes with long beaks and a single large sub-quadrate white seed. Roxb. Fl. Ind. I. 454; Bot. Mag. t. 1837; Clarke in Hook. fil. Fl. Br. Ind. IV. 152; Trimen Fl. Ceyl. III. 200; Cooke Fl. Bomb. II. 207; Prain Beng. Plants 716. *H. anisophyllum*, Beauv. Fl. Ow. et Ben. II. 62, t. 96. *Tiaridium indicum*, Lehm. Asperifol. 14; Wall. Cat. 913; Wight Ill. t. 171. *T. anisophyllum*, G. Don Gen. Syst. IV. 364. *Heliophyllum indicum*, DC. Prod. IX. 556; Fresen. in Mart. Fl. Brasil, fasc. 22, 48, t. 10, fig. 4; Miq. Fl. Ind. Bat. II. 925. *H. velutinum*, DC. l.c. 557.

SINGAPORE: *King's Collector* 318; *Hullett* 21. PAHANG: *Ridley* 1547. PENANG: *Deschamps*. PERAK: *Scortechini* 163.—DISTRIB. India, Malaya, E. Asia, tropical Africa and America.

2. HELIOTROPIUM STRIGOSUM, Willd. Sp. Pl. I. 743 (1797). Herbaceous, woody at the base, erect, a foot high, the branches few, slender, long, not spreading, very strigose, like all the rest of the plant. *Leaves* linear, ·5 to 1 in. long, very narrow, becoming smaller upwards. *Flowers* under ·1 in. long; their pedicels longer, sub-opposite to a linear bract or often extra-axillary. *Sepals* ovate-acute, enlarging in fruit. *Corolla* salver-shaped; stigma narrowly conical. *Fruit* depressed, 4-lobed, under ·1 in. broad, glabrous and shining, sometimes with a few small hairs. DC. Prod. IX. 546; Clarke in Hook. fil. Fl. Br. Ind. IV. 151; Boiss. Fl. Orient. IV. 143; Prain Beng. Plants 716. *H. brevifolium*, Wall. Cat. 914; Wall. in Roxb. Fl. Ind., ed. Carey & Wall. II. 2; DC. l.c. 546. *H compactum*, Don Prod. 101.

In all the provinces, by waysides, not common.—DISTRIB. From W. Asia through India to Australia.

4. EHRETIA, Linn.

Glabrous or scabrous shrubs or trees. *Leaves* alternate, entire or dentate. *Flowers* small, usually white, in axillary or terminal corymbs or panicles, rarely on 1-flowered axillary peduncles. *Calyx* small, 5-partite. *Corolla* with short cylindric tube; the limb with 5 obtuse imbricate spreading lobes. *Stamens* 5, inserted on the tube, exserted, rarely included, ovate or oblong. *Ovary* 2-celled, the cells bi-ovulate; sometimes imperfectly 4-celled and the cells with solitary ovules; style terminal, cylindric, bifid or bi-partite; stigmas small, capitate or clavate. *Drupe* small, usually globose, 4-seeded or (by suppression) 1–3-seeded; usually dividing into 2 bilocular or into 4 unilocular, often compressed pyrenes. *Seeds* straight, with little albumen and thin testa.—DISTRIB. About 55 species, all tropical, chiefly in the Old World.

Leaves ovate to elliptic-oblong, shortly acuminate, with about 5 pairs of main-nerves .. .. 1. *E. lævis.*
Leaves obovate or obovate-elliptic, obtuse retuse or sub-acute, with 7 or 8 pairs of main-nerves .. .. 2. *E. parallela.*

1. EHRETIA LÆVIS, Roxb. Cor. Pl. I. 42, t. 55; var. *timorensis*, Clarke in Hook. fil. Fl. Br. Ind. IV. 142 (1883). A small tree; young branches rusty-puberulous, becoming ultimately glabrous, dark coloured when dry. *Leaves* thinly coriaceous; ovate to elliptic-oblong, shortly acuminate, the base slightly cuneate or sometimes rounded; both surfaces glabrous, brown when dry, the lower paler and reticulate; main-nerves about 5 pairs, rather straight, ascending slightly, thin but prominent on the lower surface like the midrib; length 2·5 to 5 in., breadth 1·25 to 2·25 in.; petioles about ·4 in. *Cymes* axillary and terminal, shorter than the leaves, corymbose, puberulous; the ultimate branches scorpioid. *Flowers* small, numerous, sessile. *Calyx* less than ·1 in. long, its mouth with 5 oblong lobes. *Corolla-tube* ·1 in. long; the lobes 5, shorter and spreading. *Anthers* exserted. *Fruit* when 4-seeded about 2 in. in diam., smaller when 2-seeded, depressed-globose, ribbed; pyrenes 4 or 2, sometimes only 1, each with a single seed; the persistent calyx much shorter than the fruit, its lobes acuminate. *E. timorensis*, Dcne. in Nouv. Ann. Mus. d'Hist. Nat. III. 395; DC. Prod. IX. 505. *E. philippinensis*, DC. l.c. 504. *E. lævis*, Benth. Fl. Austral. IV. 389.

MALACCA: *Maingay* (K.D.) 1164; *Ridley* 3302. PERAK: *Scortechini*

167, 898; *King's Collector* 7436, 8344.—DISTRIB. Burma, *Griffith* (K.D.) 6002, Malay Archipelago, Australia.

2. EHRETIA PARALLELA, Clarke in Hook. fil. Fl. Br. Ind. IV. 143 (1883). A shrub, all parts except the inflorescence glabrous; young branches thinner than a goose-quill, pale when dry. *Leaves* membranous; obovate or obovate-elliptic, obtuse, from retuse to sub-acute, cuneate at the base; both surfaces dark brown when dry; main-nerves 7 or 8 pairs, scarcely curved, ascending, parallel, very bold and distinct on the lower surface like the midrib (when dry), faint on the upper; length 1·5 to 1·75 in., breadth ·75 to 1 in.; petiole ·25 in. Inflorescence, flowers, and fruit as in *E. lævis*, Roxb., var. *timorensis*, but smaller.

PENANG: *Curtis* 1572.—DISTRIB. Burma, *Griffith* (K.D.) 6004.

5. COLDENIA, Linn.

Much-branched, diffuse or prostrate scabrous herbs. *Leaves* alternate, crisped. *Flowers* small, axillary, sessile or sub-sessile; the upper sometimes in a short one-sided bracteate cyme. *Calyx* 4–5-partite. *Corolla* with short funnel-shaped tube and 4 or 5 spreading segments imbricate in bud. *Stamens* 4 or 5, inserted on the tube; anthers ovate. *Ovary* broadly ovoid, 2-celled, with 2 ovules in each cell, or imperfectly 4-celled with 1 in each; styles 2, distinct at the base but united upwards (although easily separable); stigmas 2, capitate. *Fruit* almost dry, composed of 4 sub-connate 1-seeded pyrenes; seeds with thin testa and little if any albumen; the cotyledons plane.—DISTRIB. Species 12, 10 of which are American, 1 African, and the undernoted which is cosmopolitan.

COLDENIA PROCUMBENS, Linn. Sp. Pl. 125 (1753). A scabrous-hairy prostrate herb. *Leaves* elliptic-obovate, coarsely and deeply serrate, almost pinnatifid. *Fruit*, prior to disintegration into its component pyrenes, pyramidal. Gaertn. Fruct. I. 329, t. 68; Lamk Ill. t. 69; Roxb. Fl. Ind. I. 448; Wall. Cat. 942; DC. Prod. IX. 558; Miq. Fl. Ind. Bat. II. 933; Clarke in Hook. fil. Fl. Br. Ind. IV. 144; Trimen Fl. Ceyl. III. 197; Cooke Bomb. Fl. II. 205; Prain Beng. Plants 718. *Lobophyllum tetrandrum*, F. Muell. in Hook. Kew Journ. Bot. IX. 21. *Waltheria microphylla*, Miq. in Pl. Hohenack. n. 87B (*not of* Cav.).

By waysides, not common.—DISTRIB. Everywhere in the tropics.

Order LXXXI. CONVOLVULACEÆ.

[BY D. PRAIN.]

Herbs or shrubs, usually twining, occasionally erect; very rarely trees; sometimes parasitic. *Leaves* alternate or in parasitic species obsolete; stipules 0. *Flowers* in cymes, rarely solitary, regular, hermaphrodite; bracts at cyme-bases or under solitary flowers opposite; bracteoles at base of pedicels small, scale-like. *Sepals* 5, imbricate, occasionally slightly connate below, often persistent, sometimes accrescent. *Corolla* campanulate or infundibuliform, rarely sub-rotate; limb with 5 short or long lobes often plicate in bud, after flowering either involute or reverting to the original æstivation. *Stamens* 5, adnate to corolla-tube; anthers oblong, opening by longitudinal introrse or lateral slits. *Carpels* usually 2, very rarely 3 or more; connate throughout in a superior ovary with its base often encircled by an annular or lobed disk, and its cells as many or, by development of accessory partitions, twice as many as the component carpels, rarely, from absorption of dissepiments, fewer than carpels; ovules 2 in each carpel, sessile erect anatropous; style solitary or rarely styles 2; stigma capitate or 2-lobed or 2-fid. *Fruit* an indehiscent often dry berry, or a 2–4-valved or circumscissile or irregularly opening capsule. *Seeds* 4 to 2, rarely solitary, erect; albumen scanty or 0; cotyledons generally plicate, rarely flat.—DISTRIB. Species about 1,000, in all regions, but more abundant in sub-tropical and tropical countries.

Corolla-tube usually uniformly enlarged from base to apex, the 5 bands or lobes rarely, except in *Erycibe*, clearly defined from the intervening spaces; pollen not spinulose:—
Yellow parasitic twining leafless herbs .. .. .. 1. CUSCUTA.
Green non-parasitic leafy herbs, shrubs or trees:—
Fruit indehiscent, woody or fleshy, rather large; style short or 0; stigma 5–10-rayed; corolla-lobes 2-fid, the lobules induplicate, contorted; woody, climbing shrubs or erect trees 2. ERYCIBE.
Fruit dehiscent, or if indehiscent small, with thin fragile walls:—
Flowers in racemes or panicles—
Bracts not enlarged in fruit; outer 3 or all of the sepals enlarged in fruit; style entire or shortly 2-lobed; capsule indehicent or rarely 2-valved .. .. .. 3. PORANA.
Bracts in fruit much enlarged, scarious, adnate to calyx; sepals not enlarged; capsule 4-valved, 1-seeded .. 4. NEUROPELTIS.
Flowers in cymes or solitary; capsule valvate or opercular, rarely dehiscing irregularly:—
Styles 2, free or partially united below; sepals not or slightly enlarging in fruit:—
Capsule 4-valved, 2–1-locular, 4–2-seeded; styles quite free, each 2-branched; cymes few-flowered .. 5. EVOLVULUS.
Capsule irregularly dehiscent, splitting into numerous vertical segments; styles usually partially united below, stigmas capitate; cymes sub-capitate .. .. 6. BONAMIA.
Style entire, stigmas usually 2:—
Ovary 1-locular; capsule 4-valved, 4-seeded; stigmas shortly oblong; calyx-lobes not enlarged in fruit:—

Bract enveloping the calyx ; pollen spherical .. 7. CALYSTEGIA.

Bract not enveloping the calyx ; pollen polyhedral .. 8. HEWITTIA.

Ovary 2-locular, sometimes 4-locular :—

Outer 3 sepals much larger than the 2 inner, and decurrent on the peduncle ; stigmas capitate .. 9. ANISEIA.

Outer 3 sepals not larger than the 2 inner, and not decurrent on the peduncle :—

Stigmas elliptic ; capsule 8-valved, rarely 4-valved 10. JACQUEMONTIA.

Stigmas globose :—

Capsule 4-valved ; fruiting sepals not enlarged ; bands of corolla usually with 5 purple lines ; stems not winged .. .. .. 11. MERREMIA.

Capsule with circumscissile dehiscence ; fruiting sepals considerably enlarged ; bands of corolla without lines ; stems winged .. .. 12. OPERCULINA.

Corolla-tube not uniformly enlarged from base to apex, the 5 bands on the lobes clearly defined by 2 prominent lines ; pollen spinulose :—

Fruit dehiscent, or if indehiscent then with thin fragile walls :—

Stamens arising from the backs of 5 scales attached to the corolla-tube ; flowers small urceolate, fasciculate ; fruit 4-valved .. .. 13. LEPISTEMON.

Stamens arising directly from the corolla-tube :—

Corolla more or less campanulate ; calyx-lobes never aristate, inflorescence never scorpioid ; stamens not exserted .. .. 14. IPOMOEA.

Corolla more or less hypocrateriform ; calyx-lobes aristate, or if obtuse the inflorescence scorpioid ; stamens exserted :—

Flowers rather small, pink or red, slightly irregular .. 15. QUAMOCLIT.

Flowers large white, regular .. .. .. 16. CALONYCTION.

Fruit indehiscent, coriaceous or fleshy :—

Ovary 4-celled .. .. 17. ARGYREIA.

Ovary 2-celled .. .. 18. LETTSOMIA.

1. CUSCUTA, Linn.

Leafless twining yellow-reddish parasitic herbs. *Flowers* small, white or rose-coloured, fascicled, sessile or shortly pedicelled ; bracts small or 0. *Sepals* 5 or 4, sub-equal ; free or shortly connate at the base. *Corolla* ovoid or campanulate, usually with a ring of fimbriate or lobed scales near the base or below the stamens ; lobes short, imbricate. *Stamens* 5 or 4, adnate near throat of corolla ; filaments short, linear ; anthers oblong, partially exserted. *Ovary* more or less completely 2-celled ; ovules 4 ; styles 2 or 1 ; stigmas 2. *Fruit* a globose or ovoid, dry or succulent, circumscissile or irregularly bursting 4–2-seeded capsule. *Seeds* glabrous ; albumen fleshy ; embryo slender, spiral ; cotyledons minute or obsolete.—DISTRIB. Species about 80, in temperate and tropical regions.

CUSCUTA HYGROPHILÆ, H. H. W. Pears. in Hook. Ic. Plant. t. 2704.

A small slender parasitic twiner. *Flowers* in dense umbellate cymes, ·25 in. wide. *Sepals* ovate obtuse, connate below, ·1 in. long. *Corolla* ·15 in. wide, campanulate; lobes ovate obtuse. *Stamens* 5, shortly exserted. *Scales* near base of corolla-tube shortly fimbriate. *Ovary* obtuse, more or less perfectly 2-celled; ovules 4; styles 2; stigmas capitate. *Fruit* an oblate capsule, ·15 in. wide.

JOHORE: near the town, parasitic on *Hygrophila quadrivalvis*, *Ridley* 9161!

Closely related to *C. chinensis*, from which it differs in having the sepals without keels, and of which the writer believes it to be a form.

2. ERYCIBE, Roxb.

Shrubs, scandent or diffuse, less often erect; rarely trees. *Leaves* alternate, elliptic, entire, coriaceous. *Flowers* rather small; cymes in axillary or terminal panicles or racemes; bracts lanceolate, small. *Sepals* 5, small, sub-equal, orbicular, coriaceous, adpressed to base of fruit. *Corolla* rather small, white or yellowish, sub-rotate; tube hirsute externally; limb 5-lobed, the lobes obcordate, induplicate-contorted in bud, with a thicker triangular centre externally hirsute, and sub-membranous semicordate margins glabrous on both sides. *Stamens* 5, sub-included, adnate to throat of corolla; filaments short; anthers ovate-lanceolate. *Ovary* globose, 1-celled; ovules 4; stigma large, sessile, sub-globose or conic, 5- or 10-ridged. *Fruit* a fleshy, leathery or woody berry, ovoid or ellipsoid. *Seed* solitary, glabrous; albumen scanty, intruded between folds of fleshy cotyledons.—DISTRIB. Species about 30; throughout S.E. Asia.

Leaves more or less pubescent beneath:—
Pubescence on under surfaces of leaves persistent:—
Branches angular; bark fissured; pubescence on under side of leaves black, closely adpressed; leaves with acuminate tips, the lateral nerves in 5 pairs, obliquely ascending, hardly visible above .. .. 1. *E. strigosa.*
Branches cylindric; bark not fissured; pubescence on under surface of leaves not adpressed, brown or tawny; leaves obtuse, the lateral nerves in 12 to 15 pairs, spreading not very oblique; fruit velvety .. .. 2. *E. magnifica.*
Pubescence on under surface of leaves usually disappearing, except from the midrib, as the leaves become old; branches with fissured bark:—
Flowers in pyramidal terminal panicles, the panicle branches subtended by foliaceous bracts .. .. .. 3. *E. expansa.*
Flowers in axillary cymes, or if passing into a terminal panicle the panicle branches not subtended by foliaceous bracts:—

Flowers often passing into a terminal panicle; corolla greenish; fruit ellipsoid, black, ·6 in. long, ·35 in. wide .. 4. *E. Princei.*

Flowers all axillary; corolla white; fruit ellipsoid, purple, with a faint apical areola, ·75 in. long, ·5 in. wide .. 5. *E. malaccensis.*

Leaves quite glabrous on both surfaces :—

Flowers in both terminal and axillary panicles; leaves with lateral nerves distinct, but secondary venation indistinct .. 6. *E. angulata.*

Flowers always axillary :—

Leaves small, never exceeding 1·75 in. long, sub-bifarious; flowers solitary, axillary .. .. 7. *E. leucoxyloides.*

Leaves medium to large, very rarely, and never all, less than 2 in. long, arranged spirally; flowers never solitary :—

Lateral nerves of leaves distinct and secondary reticulate venation distinct on both surfaces, or at least beneath :—

Lateral nerves of leaves 7 to 9 pairs .. .. 8. *E. festiva.*

Lateral nerves of leaves 6 or fewer pairs :—

Fruit quite glabrous .. .. .. 9. *E. sapotacea.*

Fruit finely velvety .. .. .. 10. *E Stapfiana.*

Lateral nerves of leaves indistinct, secondary venation not visible :—

Corolla rufous-pubescent internally as well as externally .. .. 11. *E. præcipua.*

Corolla glabrous internally :—

Flowers densely glomerate in leaf axils; leaves pale waxy greenish-yellow beneath .. .. 12. *E. glomerata.*

Flowers in short but open axillary cymes :—

Leaves thickly coriaceous; fruit verrucose but not scurfy externally .. .. .. 13. *E. aenea.*

Leaves sub-coriaceous; fruit scurfy but not verrucose externally .. .. 14. *E. Griffithii.*

1. **Erycibe strigosa**, Prain Journ. As. Soc. Beng. LXV. 2. 536. A climber 40 to 60 feet long, with stems 1 to 2 in. in diam.; branches slightly angled with fissured bark, and except along the fissures densely clothed with black adpressed tomentum; branchlets angular with black adpressed tomentum. *Leaves* elliptic or ovate-lanceolate, base cuneate, apex rather long acuminate, with tip obtuse; 3 to 4 in. long, 1·5 to 1·75 in. wide; thinly coriaceous; dark green, quite glabrous above, brownish-black and densely covered with black adpressed tomentum beneath; lateral nerves 5 pairs, oblique, distinct beneath not visible above, secondary venation indistinct beneath not visible above; petiole ·75 to 1 in. long, with close adpressed black tomentum. *Flowers* in few-flowered cymes, ·25 in. across, disposed in narrow axillary panicles 3 to 6 in. long, ·5 in. wide; main-rachis angular, densely rusty-pubescent, the peduncles of individual cymes ·25 in. long or less, densely rusty-pubescent, as are the linear deciduous bracteoles ·15 in. long, and the very short pedicels. *Sepals* orbicular, rusty-pubescent. *Corolla* white, ·3 in. across (but not quite fully opened), the lobes spreading, glabrous

within; interlobular spaces brown tomentose externally; lobules ovate, their margins sub-entire. Hallier f. Bull. Herb. Boiss. V. 737.

PERAK: Thaipeng, 500 to 800 feet elevation; *King's Collector* 8461!

2. ERYCIBE MAGNIFICA, Prain Journ. As. Soc. Beng. LXXIII. 2. 18. A strong creeper 80 to 100 feet long, stem 2 to 3 in. in diam.; old branches ·75 in. in diam. still densely tomentose, quite cylindric, with large pith; branchlets ·3 in. in diam., densely velvety with a tawny to rusty matted tomentum. *Leaves* elliptic or elliptic-obovate, with a narrowly truncate or rounded base, and an obtuse or sometimes retuse apex, the margin strongly revolute; 8 to 10 in. long, 3·5 to 4 in. wide; coriaceous; upper surface quite glabrous, dark green and shining with sometimes a silvery, sometimes a rich coppery sheen; under surface velvety, pale brownish-green, the tomentum longer, looser, and sometimes whitish on the main-nerves; lateral nerves rather straight, spreading, 12 to 15 pairs, rather distinctly looped along the margin, prominent beneath, deeply impressed above, as is the secondary reticulate venation; petiole ·35 in. long, densely rusty-velvety. *Flowers* in short axillary racemes, sometimes clustered, of close-set 2–3-flowered individual cymules; the racemes 1 to 2 in. long; peduncles, short pedicels and small ovate bracts and bracteoles densely rusty-velvety. *Sepals* orbicular, densely velvety outside, quite glabrous within, coriaceous, in fruit ·2 in. across. *Corolla* ·5 in. across; lobes slightly spreading, glabrous within, and waxy white or yellow, narrow and deeply divided; interlobular spaces densely dark brown, almost black velvety-pubescent externally; lobules very small oblong. *Fruit* ellipsoid, 1·25 in. long, 1 in. in diam., densely softly velvety, of a rich brown colour.

PERAK: *King's Collector* 3454! 3879! 6721!

In the first of his three gatherings Kunstler has noted this as a tree 50 to 70 feet high, but in the two subsequent ones as a large creeper, which is, from the appearance of the specimens, undoubtedly the case with the first gathering also.

3. ERYCIBE EXPANSA, Wall. Cat. 1331. A large climber, branches angled, with fissured bark, glabrous; branchlets angular, densely rusty-tomentose. *Leaves* elliptic or slightly obovate, apex abruptly shortly acuminate to a sharp tip, base rounded or sub-cordate; 2 to 2·5 in. long, 1 to 1·5 in. wide; chartaceous; dark green, quite glabrous above, paler and rusty-pubescent, especially on the nerves, beneath, the pubescence ultimately disappearing except from the nerves in old leaves; lateral nerves 2 to 3 pairs, very oblique, ascending; secondary reticulate venation fairly visible above only; petioles ·15 in. long, densely rusty-pubescent. *Flowers* in rather condensed 5–9-flowered cymes disposed in pyra-

midal terminal panicles 3 to 15 in. long, 1·5 to 6 in. wide, the main rachis and branches densely rusty-tomentose, the panicle branches ·75 to 2·5 in. long, subtended by large foliaceous bracts ·4 to 1 in. long, exactly like the foliage leaves but smaller; peduncles of individual cymes rusty-tomentose, ·25 in. long; pedicels bracteolate, ·1 in. long or less, rusty-tomentose. *Sepals* orbicular, rusty-pubescent. *Corolla* white, or white tinged with pink, ·45 in. wide; lobes spreading, glabrous within; interlobular spaces densely rusty-pubescent externally; lobules ovate acute, their margins sub-entire. G. Don Gen. Syst. IV. 392; Clarke in Hook. f. Flor. Brit. Ind. IV. 181; Prain Journ. As. Soc. Beng. LXIII. 2. 84; Hallier f. Bull. Herb. Boiss. V. 737. *E. ferruginosa*, Griff. Notul. IV. 283. *E. paniculata*, β. *expansa*, Choisy Ann. Sc. Nat. 2. I. 222; DC. Prod. IX. 464. *E. coriacea*, Kurz For. Flor. Burm. II. 213 *partly* (*not of* Wall.).

Kẹdah: Lankawi, *Curtis* 2128!—Distrib. Tenasserim.

4. **Erýcibe Princei**, Wall. Cat. 1335. A large straggling bush with spreading branches, or a stout climber; branches glabrous, the bark more or less fissured but quite cylindric; branchlets densely rusty-tomentose, cylindric. *Leaves* obovate-oblong or rarely obovate-lanceolate, narrowed slightly to the narrowly truncate or sometimes rounded base, more abruptly to the shortly acuminate or acute apex, with an obtuse or occasionally acute tip; 2·5 to 4 in. long, 1·25 to 1·75 in. wide; coriaceous, shrinking somewhat irregularly when dry; glabrous rather pale green above, beneath at first rusty pubescent with a loose tomentum, which soon disappears except from the midrib; lateral nerves 5 to 7 pairs, very oblique and not very prominent on either surface, with a distinct sub-marginal looping vein; secondary reticulate venation distinct but not prominent on either surface; petiole ·2 to ·25 in. long, rusty-pubescent. *Flowers* in axillary cymes in the uppermost leaf axils, 5–9-flowered, ·75 in. wide, the ultimate 3 to 7 passing into a terminal panicle without leaves 1·5 to 3 in. long, rarely longer; peduncles ·15 to ·25 in. long, rusty-pubescent; pedicels very short and lanceolate bracteoles, ·2 in. long, rusty-pubescent. *Sepals* orbicular, coriaceous, rusty-pubescent. *Corolla* greenish, sweet-scented, ·4 in. across; lobes slightly spreading; interlobular spaces shining golden silky externally; lobules ovate, margins finely undulate. *Fruit* ellipsoid, black, smooth, ·6 in. long, ·35 in. in diam. Choisy in Ann. Sc. Nat. 2. I. 224; DC. Prod. IX. 464; Clarke in Hook. f. Flor. Brit. Ind. IV. 152; Prain Journ. As. Soc. Beng. LXIII. 2. 85; Hallier f. Bull. Herb. Boiss. V. 737 (excluding the Assam and Khasia localities), 1052. *E. camptobotrya*, Miq. Flor. Ind. Bat. Suppl. 578.

Malacca: *Griffith* 5883 (K.D.)! *Maingay* 1155 (K.D.)! Singa-

PORE: in hedges, frequent, *Kurz* 2968! *Hullett* 628! 642!—DISTRIB. Bangka, Sumatra, Borneo.

5. ERYCIBE MALACCENSIS, Clarke in Hook. f. Flor. Brit. Ind. IV. 182. A stout spreading shrub with straggling branches, or a climber extending to 100 feet in length; branches glabrous, with fissured bark, but cylindric; branchlets stellately puberulous, rather distinctly angled. *Leaves* elliptic, oblong or obovate-oblong, narrowed from the middle or beyond to the cuneate or narrowly truncate base and more abruptly to the shortly acuminate apex with obtuse tip; 3 to 3·5 in. long, 1·25 to 1·5 in. wide; thickly chartaceous; dark green, shining, quite glabrous above; paler glaucescent beneath and at first pubescent with a deciduous tomentum which soon disappears except from the rusty midrib; lateral nerves 5 to 6 pairs, usually very oblique, rather distinct on both surfaces as is the secondary reticulate venation; petiole ·25 in. long, rusty-tomentose. *Flowers* in axillary 5–9-flowered cymes, ·5 in. wide; peduncles ·2 to 1·5 in. long, rusty-tomentose; bracteoles elliptic, fulvous-tomentose, small; pedicels ·15 in. long, rusty. *Sepals* orbicular, fulvous-tomentose. *Corolla* glabrous within, white, ·35 in. across; lobes slightly spreading; interlobular spaces fulvous-tomentose externally; lobules ovate, margins slightly undulate. *Fruit* ellipsoid, purple, ·75 in. long, ·5 in. in diam. with a faint apical areola, glabrous. Prain Journ. As. Soc. Beng. LXIII. 2. 85; Hallier f. Bull. Herb. Boiss. V. 738.

PERAK: Larut, *King's Collector* 3093! 3180! 3575! *Scortechini* 2196! Kota, *Wray* 2412! PENANG: *Maingay* 1154! MALACCA: Bukit Labukor, *Ridley* 3526! Batu Tiga, *Derry* 1042!—DISTRIB. Tenasserim.

6. ERYCIBE ANGULATA, Prain Journ. As. Soc. Beng. LXIII. 2. 84. A robust scandent shrub or a strong climber; stems sometimes over 100 feet long and 4 to 6 in. in diam.; branches terete, glabrous; ultimate branchlets angular, rusty-pubescent. *Leaves* obovate, base cuneate or rounded, apex shortly acuminate or rounded or sometimes deeply emarginate (normally shortly acuminate); 4 to 8 in. long, 2 to 4 in. wide; coriaceous, quite glabrous; lateral nerves 5 to 8 pairs, visible above, distinctly raised beneath; secondary venation indistinct; petioles ·5 in. long, rusty-pubescent. *Flowers* in few-flowered cymes disposed in axillary and terminal panicles with angular rachis clothed with dark-red tomentum; axillary inflorescences 1 to 6 in. long, 1 to 1·5 in. wide, terminal 7 to 10 in. long, with sometimes floral leaves intermixed; pedicels bracteolate, ·25 to ·5 in. long. *Sepals* orbicular, outer stellately rusty-tomentose, inner ciliate. *Corolla* white, ·5 in. wide; lobes spreading; interlobular spaces hirsute externally; lobules glabrous, ovate-oblong, with slightly undulate margins. Hallier f. Bull. Herb.

Boiss. V. 739. *E. paniculata*, Miq. Flor. Ind. Bat. Suppl. 248 (*not of* Roxb.).

PERAK: Larut, *King's Collector* 7379! Dijong, *Scortechini* 1816!—DISTRIB. Sumatra (*Teysmann* 3682).

When originally describing this species the writer referred to it a Java specimen collected by Kurz; Dr. Hallier, however, whose knowledge of *Convolvulaceæ* is so profound, has shown that this Java specimen, which is not a very good one, belongs in reality to a distinct species—*E. macrophylla*, Hallier f.

7. **ERYCIBE LEUCOXYLOIDES**, King MSS. ex Ridl. in Herb. Singap.; Prain Journ. As. Soc. Beng. LXXIII. 2. 16. A very large climber with slender cylindric branches, bark fissured and covered with a close grey pubescence; branchlets numerous, very slender, rather distinctly angled, grey- or rusty-pubescent. *Leaves* sub-bifarious, ovate or ovate-lanceolate, base rounded, apex sub-acuminate or abruptly narrowed to an obtuse tip; 1 to 1·75 in. long, ·4 to ·6 in. wide; membranous or thinly chartaceous; quite glabrous on both surfaces; rather dark green above, paler beneath; secondary nerves about 3 pairs, very oblique and hardly visible above except in young leaves, not visible beneath even when dry and even when young; petiole ·1 in. long, grey-pubescent. *Flowers* axillary, solitary; pedicels ·2 in. long, somewhat recurved in fruit, grey-pubescent, bracteolate under the calyx. *Sepals* orbicular, sparsely pubescent on the centre externally, elsewhere glabrous except the ciliate margins. *Corolla* white, sweet-scented, ·5 in. across; interlobular spaces brown-tomentose externally; lobules broad, semi-orbicular, entire. *Fruit* elliptic, black, smooth, glabrous, ·6 in. long, ·4 in. wide.

SINGAPORE: climbing in secondary jungle, *Hallier! Ridley* 2051, 6897! 10927! SELANGOR: Kwala Lumpar, *Curtis* 2402! JOHORE: *Ridley!*

8. **ERYCIBE FESTIVA**, Prain Journ. As. Soc. Beng. LXIII. 2. 87. A climber, 60 to 70 feet long (*Kunstler*), or a small tree (*Hullett*); branches grooved but cylindric; ultimate branchlets slightly angular, sparingly pubescent. *Leaves* elliptic or oblong, base cuneate, apex usually rather long acuminate with an obtuse tip; 3 to 6 in. long, 1·5 to 2·5 in. wide; glabrous; thinly coriaceous; lateral nerves 7 to 9 pairs, distinct on both surfaces, especially beneath, secondary venation distinct beneath; petiole glabrous, ·5 to ·75 in. long. *Flowers* in short axillary 7–12-flowered cymes ·5 to ·75 in. across; peduncles ·3 to ·5 in. long, rusty-pubescent; pedicels rusty-pubescent, bracteolate, ·12 in. long. *Sepals* orbicular, rusty-pubescent. *Corolla* pale greenish-white within, ·75 in. across, lobes broad; interlobular spaces brown-tomentose externally; lobules ovate, margins erose, usually rather deeply, through-

out.' Prain Journ. As. Soc. Beng. LXV. 2. 536; Hallier f. Bull. Herb Boiss. V. 739.

PERAK: in open forest in rocky localities, at 500 to 800 feet elevation, *King's. Collector* 6445! SINGAPORE: garden jungle, *Ridley* 6043! *Hullett!*

9. ERYCIBE SAPOTACEA, Hallier f. & Prain Journ. As. Soc. Beng. LXXIII. 2. 16. A tree (?); branches slightly angled, with fissured bark, quite glabrous. *Leaves* elliptic, base cuneate, apex abruptly shortly acuminate with tip obtuse; 5 in. long, 2 to 2·25 in. wide; firmly coriaceous; quite glabrous on both sides; bright green and glossy above, pale beneath; lateral nerves 6 pairs, distinct above and rather prominent beneath, secondary reticulate venation very distinct on both surfaces; petiole ·5 in. long, glabrous. *Flowers* in few-flowered congested, axillary subsessile cymes. *Sepals* and *Corolla* not seen. *Fruit* ovoid, quite glabrous, the epicarp very coriaceous, almost woody, wrinkled and fissured, with a rounded base and conical pointed apex, 2 in. long, 1 in. in diam.; fruiting pedicels ·3 in. long, with epidermis fissured like that on the branches.

PENANG: Government Hill, *Curtis* 772!

A very distinct and striking species, the flowers of which are as yet unknown. In shape the fruit is most like that of *E. Griffithii*, but besides being about twice the size it has none of the scurfy covering of the fruit of that species. The leaves of the two are very different.

10. ERYCIBE STAPFIANA, Prain Journ. As. Soc. Beng. LXIII. 2. 87. A shrubby or slender climber, sometimes 80 to 100 feet long; much branched; branches and glabrous branchlets cylindric. *Leaves* usually oblong or elliptic, rarely narrowly lanceolate, narrowed to a cuneate or narrowly truncate base, apex shortly acuminate with a blunt tip; 4 to 7 in. long, 2 to 3 in. wide; coriaceous; glabrous; dark green and glossy above, paler beneath; lateral nerves 4 to 6 pairs, ascending obliquely, the lowest pairs extending more than half-way along the margin, the secondary veins reticulately raised beneath, visible but not conspicuous above; petiole ·25 in. long, glabrous. *Flowers* in clustered axillary cymes ·5 to 2 in. long, in fascicles of 4 to 9 from a woody protuberance, each 5–20-flowered; peduncles densely dark-brown-tomentose, as are the bracteolate pedicels, ·1 to ·15 in. long. *Sepals* orbicular, densely brown-tomentose. *Corolla* waxy-white within, ·5 in. across; lobes narrow; interlobular spaces very dark-brown-tomentose (nearly black—*Kunstler*) externally; lobules narrow, divergent, slightly crenulate along the obliquely truncate apex. *Fruit* ovoid, ·6 to ·8 in. long, ·5 in. in diam., densely clothed with a fine dark-brown velvety tomentum. Hallier f. Bull. Herb. Boiss. V. 738.

PERAK: at various elevations from 300 to 4,000 feet, *King's Collector* 4015! 4115! 7784! *Wray* 3371! *Scortechini* 1793!—DISTRIB. Tenasserim (*Parish*).

11. ERYCIBE PRÆCIPUA, Prain Journ. As. Soc. Beng. LXIII. 2. 86. A large climbing shrub; branches and ultimate branchlets cylindric, glabrous. *Leaves* narrowly elliptic to elliptic, narrowed to the cuneate base and more abruptly to the obtuse tip; thickly coriaceous; quite glabrous; 1·5 to 4 in. long, ·75 to 2 in. wide; nerves about 5 pairs, curved and ascending, but all very obscure even when dry; petioles ·3 in. long, glabrous. *Flowers* in small, axillary, laxly 5–8-flowered cymes ·5 in. across; peduncles and bracteolate pedicels closely rusty-pubescent, pedicels ·12 in. long. *Sepals* orbicular, the outer minutely, the inner densely closely rusty-pubescent. *Corolla* whitish, ·5 in. wide, the lobes very narrow, spreading; interlobular spaces rufous-pubescent internally as well as externally; lobules small glabrous, narrowly oblong, sub-acute, divergent. *Fruit* ovoid, slightly rough but not verrucose, ·7 to ·75 in. long, ·5 to ·6 in. wide, pointed or rounded.

PENANG: Government Hill, *Curtis* 911! 1273! PERAK: Larut, *Scortechini!*

Father Scortechini's specimens from Perak have the fruit slightly smaller, not at all pointed, and not so distinctly roughened as the Penang specimens, but in all other respects the two plants agree.

12. ERYCIBE GLOMERATA, Bl. Bijdr. 1047. A shrub or a small tree, 10 to 20 feet high, erect, much spreading; branches and sparingly pubescent ultimate branchlets cylindric. *Leaves* elliptic or narrow-oblong, shortly or gradually narrowed to the cuneate base and to the obtuse tip; 7 to 12 in. long, 1·75 to 5 in. wide; coriaceous; quite glabrous; dark green above, waxy-pale greenish-yellow (*Kunstler*) beneath; lateral nerves 8 to 9 pairs, visible but not raised on either surface or only faintly raised beneath; petiole ·15 to ·35 in. long. *Flowers* in axillary very short and closely glomerate 5–8-flowered cymes; peduncles ·05 in. long; individual flowers nearly sessile with 3 rusty-pubescent bracteoles at the base of the calyx. *Sepals* almost glabrous, pale waxy-green (*Kunstler*), orbicular, margins ciliate. *Corolla* pure white within, 1·25 in. across; lobes narrow; interlobular spaces rufous externally; lobules oblong, obtuse, slightly crenulate at the apex. Hallier f. Bull. Herb. Boiss. V. 382, 739. *E. albida*, Prain Journ. As. Soc. Beng. LXIII. 2. 87.

VAR. *typica; leaves* elliptic, 3·5 to 5 in. wide.

PERAK: on Gunong Bubu, 2,500 to 3,000 feet, *King's Collector* 7373! Larut, *Scortechini!* PUNGAH: *Curtis* 2947!—DISTRIB. Java.

Var. *longifolia*, Bl. Bijdr. 1047; *leaves* cuneate-oblong, obtusely acuminate, 1·75 to 2·25 in. wide. *E. angustifolia*, Hallier f. Engl. Bot. Jahrb. XVI. 524.

Perak: Waterfall Hill, *Wray* 2580! Malacca: Bujong, *Scortechini* 1908!—Distrib. Java, Borneo.

13. Erycibe aenea, Prain Journ. As. Soc. Beng. LXIII. 2. 85. A very large climber; stems 70 to 150 feet long, 3 to 4 in. in diam.; branches and densely rusty-tomentose branchlets cylindric. *Leaves* narrowly oblong or elliptic, base cuneate, apex gradually or oftener abruptly narrowed to an obtuse tip; thickly coriaceous; quite glabrous; 2·5 to 5 in. long, 1 to 2 in. wide; lateral nerves 5 to 6 pairs with a distinct sub-marginal connecting nerve, impressed on both surfaces but especially beneath; petiole ·25 in. or less. *Flowers* in axillary 3–20-flowered cymes ·25 to 1·2 in. long; peduncles and bracteolate pedicels minutely closely rusty-tomentose; pedicels ·12 in. long. *Sepals* orbicular, closely brown-tomentose. *Corolla* pale yellow, ·5 in. across, the lobes spreading; interlobular spaces pale brown-tomentose externally; lobules ovate-oblong, their margins undulate. *Fruit* elliptic, verrucose, grey, ·9 in. long, ·5 to ·6 in. wide. Hallier f. Bull. Hort. Boiss. V. 739.

Perak: Larut, at elevations of from 300 to 2,500 feet, *King's Collector* 7337! 8165!

14. Erycibe Griffithii, Clarke in Hook. f. Flor. Brit. Ind. IV. 182. A climber 60 to 80 feet long; stem 4 to 6 in. in diam.; branches cylindric, glabrous; branchlets cylindric, sparingly rusty-pubescent. *Leaves* elliptic, rarely ovate-lanceolate or obovate-oblong, base cuneate or rarely rounded, apex usually abruptly acuminate, less often gradually narrowed to the obtuse tip; 2·75 to 6 in. long, ·75 to 2·5 in. wide; quite glabrous on both surfaces, sub-coriaceous; lateral nerves 6 to 8 pairs, very oblique, visible but not prominent above, prominent beneath; secondary venation very indistinct; petiole ·25 to ·3 in. long, glabrous. *Flowers* in short axillary solitary or clustered 4–9-flowered cymes ·3 in. across; peduncles rusty-pubescent, ·2 to ·3 in. long; pedicels ·25 in. long, rusty-pubescent as are the very minute ovate-lanceolate bracteoles. *Sepals* orbicular, rusty-pubescent externally. *Corolla* waxy cream-coloured and glabrous within, ·5 in. across, the lobes spreading, narrow and stellate; interlobular spaces rusty-brown externally; lobules narrow acute, their margins sub-entire. *Fruit* coriaceous, greyish-brown and closely scurfy externally, 1 to 1·5 in. long, ·5 to ·75 in. wide. Prain Journ. As. Soc. Beng. LXIII. 85; Hallier f. Verslag. Buitenzorg, 1895. 126; Bull. Herb. Boiss. V. 738, 1052. *E. Maingayi*, Clarke in Hook. f. Flor. Brit. Ind. IV. 182; Hallier f. Bull. Herb. Boiss. V. 737. *E. micrantha*, Hallier f. Engl. Bot. Jahrb. XVI. 524.

Perak: Larut, 200 to 300 feet elevation, *King's Collector* 8191! *Scortechini!* Malacca: *Maingay.* Penang: *Gaudichaud* 120; *Curtis* 181! *King's Collector* 1458!—Distrib. Tenasserim, Sumatra, Philippines.

3. Porana, Burm.

Large climbers. *Leaves* petioled, ovate or cordate, entire. *Flowers* small; cymes often in large panicles; bracts persistent; bracteoles subulate or 0. *Sepals* 5, small and narrow in flower; in fruit the outer 3 or all 5 much accrescent, membranous and spreading, usually spathulate. *Corolla* white, campanulate or infundibuliform with a wide or narrow throat; limb spreading plicate, sub-entire or 5-lobed. *Stamens* 5, adnate to corolla-tube, sub-included; filaments linear or filiform. *Ovary* 2-celled or 1-celled; ovules 4 or 2; style long or short, entire or 2-fid; stigma solitary 2-lobed, or stigmas 2, capitate. *Fruit* globose oblong or obconic, 1-seeded, membranous, indehiscent or opening by 2 valves. *Seed* glabrous; cotyledons plicate.—Distrib. Species about 10, throughout S.E. Asia.

Porana volubilis, Burm. Fl. Ind. 51. t. 21. f. 1. A large climber; stems and warted branches glabrous, young shoots pubescent. *Leaves* glabrous, ovate sub-cordate, or sometimes base rounded, apex shortly acuminate, quite glabrous, 2·5 in. long, 1·5 in. wide; petiole ·6 in. long. *Flowers* white, small, in sub-ebracteate cymes disposed in panicles 12 to 15 in. long, minutely tawny-pubescent; pedicels ·1 to ·25 in. long. *Sepals* 5, minutely pubescent, in flower ·2 in. long, oblong; in fruit ·35 in. long, sub-spathulate, all equal. *Corolla* ·3 in. long; tube narrow; limb rather distinctly 5-lobed. *Stamens* 5, included. *Ovary* 2-celled; ovules 4; style 2-partite; stigmas small, capitate. *Fruit* a globose capsule, enclosed in the accrescent 5–7-nerved calyx-lobes, ·15 in. in diam. *Seed* solitary. Lamk Ill. t. 186; Roxb. Fl. Ind. ed. Carey & Wall. II. 40; ed. orig. I. 465; Blume Bijdr. 723; Wall. Cat. 1327; Choisy Convolv. Or. 106, and in DC. Prod. IX. 436; Clarke in Hook. f. Flor. Brit. Ind. IV. 222.

Malacca: *Griffith!* *King!*—Distrib. Indo-China, Malay Archipelago.

King's examples are from a cultivated plant; whether those of Griffith be from wild plants is unknown.

4. Neuropeltis, Wall.

Large scandent, tomentose shrubs. *Leaves* ovate or oblong, firm, petioled. *Flowers* many, small, in axillary racemes or terminal panicles; pedicels distinct, beset by solitary ovate-lanceolate bracteoles under the calyx, in flower inconspicuous, in fruit greatly accrescent.

Sepals 5, sub-orbicular, hardly altered in fruit. *Corolla* small, white; tube wide-campanulate; limb deeply 5-lobed, the lobes induplicate-valvate in bud. *Stamens* 5, exserted or included, adnate to corolla-tube; filaments filiform. *Ovary* imperfectly or perfectly 2-celled; ovules 4; styles 2, free throughout, stigmas sub-capitate wavy or obscurely lobed. *Fruit* a globose, 4-valved, 1-seeded capsule sessile near the centre of the flat, much-accrescent bracteole. *Seed* globose, glabrous, albuminous; cotyledons plicate.—DISTRIB. Species 2, in tropics of Eastern Hemisphere.

NEUROPELTIS RACEMOSA, Wall. Cat. 1322. A robust climber; branchlets pubescent, lenticellate, rather dark. *Leaves* alternate, elliptic-lanceolate, base cuneate, apex acuminate with a narrow longish thickened mucro; lamina 2·5 to 5 in. long, 1·25 to 2·25 in. wide; firmly papery; glabrous except along the midrib above, slightly rusty with a sub-persistent pubescence beneath; lateral nerves about 7-paired, somewhat curved forward, rather prominent and pubescent beneath. *Flowers* in axillary racemes 2 to 5 in. long, peduncle ·5 to 1 in. and rachis rusty-tomentose; bracts small ovate; pedicels ·12 to ·2 in. long, tomentose, slender, with an ovate-lanceolate bracteole under the calyx. *Sepals* 5, somewhat connate below, small, orbicular, rufous-villous. *Corolla* small, campanulate, white, tube rufous-villous externally; limb ·25 to ·3 in. across, 5-lobed, lobes ovate nearly as long as the tube. *Stamens* 5, adnate to corolla-tube, exserted; filaments thickened at base. *Ovary* imperfectly or perfectly 2-celled, rufous-villous at base; ovules 2 in each cell; styles 2, glabrous; stigmas large globose wavy. *Capsule* ·25 in. long, ovoid, glabrescent, sessile in the centre of the accrescent, orbicular, scarious, reticulate bract 1 to 1·75 in. wide with rounded or cordate base. *Seed* globose, glabrous, albuminous; cotyledons plicate. Roxb. Flor. Ind. ed. Carey & Wall. II. 44; Deless. Ic. Select. V. t. 96; Choisy Convolv. Or. 109, t. 2. f. 12, and in DC. Prod. IX. 437; Bedd. Ic. Pl. Ind. Or. t. 291; Kurz For. Flor. Burm. II. 222; Clarke in Hook f. Flor. Brit. Ind. IV. 225. *N. ovata*, Wall. Cat. 1323; Choisy Convolv. Or. 110, t. 2, f. 13, and in DC. Prod. IX. 437. *N. bracteata*, Griff. Notul. IV. 285. *N. intermedia*, Griff. Notul. IV. 285.

PERAK: Larut, *Scortechini* 1483! 1489! 2071! *King's Collector* 3544! 3792! 4370! 6809! PENANG: *Wallich!* MALACCA: *Maingay* 1152! 1153! SINGAPORE: *Wallich!*—DISTRIB. Malabar, Borneo.

5. EVOLVULUS, Linn.

Small prostrate or erect herbs or undershrubs, never climbing. *Leaves* small, entire, often distichous. *Flowers* small, blueish or white, in axillary few-flowered peduncled or sub-sessile cymes. *Sepals* 5, small, sub-equal, not enlarged in fruit. *Corolla* small, funnel-shaped or sub-rotate; limb plicate, sub-entire. *Stamens* 5, included or exserted; filaments filiform. *Ovary* 2-celled or, rarely, 1-celled; ovules 4; styles 2, free from the base, each cleft into 2 linear or sub-clavate stigmas, papillose on the inner face. *Fruit* a 4-valved, less often a 2-valved capsule, 2-celled or 1-celled. *Seeds* 4 or 2, rarely solitary, glabrous; cotyledons twice plicate.—DISTRIB. Species about 80, mostly tropical American; the present the only Asiatic.

EVOLVULUS ALSINOIDES, Linn. Sp. Pl. ed. II. 392. A small perennial herb; annual branches numerous, wiry, often prostrate. *Leaves* variable in shape from lanceolate to ovate, and in pubescence from sparingly silky to densely tawny or rufous-tomentose; ·25 to 1 in. or occasionally 1·5 in. long, ·2 to ·5 in. wide; petiole absent or short, rarely ·2 in. long. *Flowers* 1 to 3, on peduncles ·1 in. to 1 or 1·5 in. long; bracts small, linear, hirsute, persistent; pedicels ·05 to ·5 in. long. *Sepals* 5, lanceolate, hirsute, ·1 to ·15 in. long. *Corolla* pale blue or white, transparent, ·25 to ·3 in. long. *Capsule* globose, ·15 in. in diam., 4-valved. *Seeds* 4, glabrous. Burm. Fl. Zeyl. 9, t. 6, f. 1; Wall. Cat. 1317; Roxb. Flor. Ind. II. 105; Choisy in DC. Prod. IX. 447; Clarke in Hook f. Flor. Brit. Ind. IV. 220. *E. linifolius*, Linn. Sp. Pl. ed. II. 392; Choisy in DC. Prod. IX. 449. *E. angustifolius*, Roxb. Flor. Ind. ed. Carey & Wall. II. 107. *E. hirsutus*, Lamk Encyc. Meth. III. 538; Ill. t. 216, f. 2; Choisy in DC. Prod. IX. 447, excl. syn. Roxb. *E. sericeus*, Wall. Cat. 1315. *Convolvulus valerianoides*, Blanco Fl. Filip. 90.

NICOBARS: Kamorta, *Kurz!* SINGAPORE: Changi, *Ridley!*—DISTRIB. Cosmopolitan in the tropics.

The form recorded from the Nicobars and Singapore is the narrow-leaved form, which is *E. linifolius* Linn. In both localities it is probably an introduced weed.

6. BONAMIA, Thouars.

Large climbing shrubs. *Leaves* large ovate-cordate, entire, firm. *Flowers* medium, in axillary peduncled cymes; bracts small. *Sepals* 5, sub-equal, firm, ovate. *Corolla* infundibuliform, tube hirsute externally except opposite the sepals; limb 5-lobed, plicate. *Stamens*, 5, included, adnate to corolla-tube; filaments filiform, at least in upper part. *Ovary* 2-celled; ovules 4; style 2-fid to the middle; stigmas 2, capitate. *Fruit* a globose or ovoid capsule; valves thin, splitting irregularly at their apices. *Seeds* normally 4, glabrous or nearly so.—DISTRIB. Species about 30, throughout the tropics.

BONAMIA SEMIDIGYNA, Hallier f. Engl. Bot. Jahrb. XVI. 528. A large twining shrub; stems and leaves rusty-tomentose. *Leaves* ovate-cordate, entire, apex acute; length 4 in., width 2·5 in.; petiole 1·5 in. long. *Flowers* medium, in axillary sub-capitate 2–5-flowered cymes; peduncles 1 to 2 in. long, rusty-villous as are the pedicels and sepals; bracts ·25 in. long, oblong, rusty-villous. *Sepals* ·35 to ·5 in. long, ovate-oblong, sub-acute, sub-equal. *Corolla* yellowish, wide-infundibuliform, 1·5 in. long; tube hirsute externally; limb sub-entire. *Style* ·6 in. long. *Capsule* sub-globose, glabrous, ·5 in. in diam., splitting into many vertical segments, hardly covered by the slightly accrescent, ovate fruiting sepals. *Seeds* sub-glabrous. Bull. Herb. Boiss. V. 1814. *Convolvulus semidigynus*, Roxb. Hort. Beng. 13; Flor. Ind. I. 468; Wall. Cat. 1405. *Breweria cordata*, Bl. Bijdr. 722; Choisy in DC. Prod. IX. 438; Clarke in Hook. f. Flor. Brit. Ind. IV. 223. *B. Roxburghii*, Choisy Convolv. Or. III., and in DC. Prod. IX. 438; Wight, Ic. t. 1370; Dalz & Gibs. Bomb. Fl. 162. *B. madagascariensis*, Choisy Mem. Soc. Phys. Genev. 493.

PROV. WELLESLEY: at Kubang Ulu, *Curtis!* PENANG: on the coast, *Porter! Curtis* 1703! PERAK: Ipoh, *Curtis* 3166!—DISTRIB. S.E. Asia generally, Mascarenes.

7. CALYSTEGIA, R. Br.

Prostrate or twining perennial herbs. *Leaves* entire or lobed, glabrous or nearly so. *Flowers* medium, axillary solitary or rarely in few-flowered cymes; bracts 2, large, leafy, embracing the calyx, persistent. *Sepals* 5, ovate or oblong, the innermost 2 rather the smallest. *Corolla* funnel-shaped or campanulate; tube glabrous externally with 5 bands in centre of component petals, each with 5 pellucid lines at the base; limb sub-entire plicate. *Stamens* 5, adnate to corolla-tube, included; filaments sub-equal. *Ovary* 1-celled or imperfectly 2-celled; ovules 4; style filiform, entire; stigma of 2 oblong lobes. *Fruit* a globose, 1-celled, 4-valved, 4-seeded capsule. *Seeds* black, glabrous or verrucose.—DISTRIB. Species 16 to 20, in warm and temperate regions.

CALYSTEGIA HEDERACEA Wall. Cat. 1328. A prostrate or climbing weed of cultivated places and hedges. *Leaves* somewhat irregular, cordate or sagittate, lobed or rarely entire, 1 to 3 in. long, ·75 to 1 in. wide; petiole 1 in. long. *Flowers* axillary solitary; peduncles 1 in. long; bracts 2 ovate, ·3 in. across, persistent, enclosing the calyx. *Sepals* 5, oblong, obtuse, glabrous, outer ·3 in. long, inner rather smaller. *Corolla* sub-campanulate, pinkish purple, tube 1 in. long; limb plicate, sub-entire. *Capsule* ovoid, sub-acute, glabrous, ·3 in. long.

Seeds glabrous. Roxb. Flor. Ind. ed. Carey & Wall. II. 94; Choisy Convolv. Or. 103, and in DC. Prod. IX. 434; Clarke in Hook. f. Flor. Brit. Ind. IV. 217. *Convolvulus Wallichianus*, Spreng. Syst. cur. post. 61.

PENANG: *Porter*, fide Wallich.—DISTRIB. Northern India, Afghanistan, Eastern Asia.

Possibly only a casual weed in our area.

8. HEWITTIA, W. & A.

A pubescent twining herb. *Leaves* cordate, entire angled or lobed. *Flowers* axillary solitary, or in few-flowered cymes; bracts below the calyx 2, linear-lanceolate. *Sepals* 5, acute; outer 3 wide-ovate, accrescent in fruit, inner 2 narrow-lanceolate. *Corolla* medium, yellow or white with a purple eye; tube campanulate; limb plicate. *Stamens* 5, included, adnate to corolla-tube; filaments linear with dilated bases. *Ovary* 1-celled or imperfectly 2-celled; ovules 4; style filiform; stigma of 2 ovate-oblong lobes. *Fruit* a globose, 4-valved, 1-celled, normally 4-seeded capsule. *Seeds* black, glabrous.—DISTRIB. A single species, throughout the tropics of the Eastern Hemisphere and Polynesia.

HEWITTIA BICOLOR, Wight Ic. t. 835. A pubescent perennial herb; stems twining. *Leaves* cordate, entire angled or lobed, pubescent, 2 to 4 in. long; petiole ·5 in. long. *Flowers* on axillary 1–few-flowered peduncles ·5 to 4 in. long; bracts 2, narrow-lanceolate, ·25 to ·5 in. long, situated a short distance below the calyx. *Sepals* 5, the outer ovate, accrescent; the inner narrowly lanceolate, ·3 to ·5 in. long. *Corolla* yellow or whitish with a purple patch in lower part of tube, rather widely campanulate, 1 in. long; tube externally hirsute; lobes 5, very short. *Stamens* 5, included; filaments linear with dilated bases. *Ovary* hirsute, more or less perfectly 2-celled; ovules 4; style filiform; stigmas 2, ovate-oblong. *Fruit* a globose capsule, ·25 in. in diam., 1-celled, opening by 4 valves. *Seeds* 4, black, glabrous. Wight Ill. t. 168; Clarke in Hook. f. Flor. Brit. Ind. IV. 216. *Convolvulus bicolor*, Vahl. Symb. III. 25; Bot. Mag. t. 2205; Roxb. Hort. Beng. 14; Flor. Ind. I. 475; Flor. Ind. ed. Carey & Wall. II. 57; Wall. Cat. 1410. *C. bracteatus*, Vahl Symb. III. 25. *C. involucratus*, Ker in Bot. Reg. t. 318 (*not of* Spreng.). *Ipomœa bicolor*, Sweet Hort. Brit. ed. 2, 372. *I. bracteata*, Bl. Bijdr. 711 (*not of* Willd. *nor of* Wight). *I. Weinmanni* Roem. & Schult. Syst. Nat. IV. 243. *Calystegia Keriana*, Sweet Hort. Brit. ed. 2, 370. *Palmia bicolor*, Endl. ex Dalz. & Gibs. Bomb. Flor. 163. *Shuteria bicolor*, Choisy Convolv. Or. 104, and in DC. Prod. IX. 435; Flor. des Serres t. 421. *Aniseia Afzelii*, G. Don Gen. Syst. IV. 295. *A. bracteata*, Hassk. Pl. Jav. Rar. 516.

PERAK: Larut, *Scortechini!*—DISTRIB. Tropical Africa, S.E. Asia generally, Polynesia.

9. ANISEIA, Choisy.

Twining herbs. *Leaves* elliptic, mucronulate or lanceolate. *Flowers* axillary, solitary or in few-flowered cymes. *Sepals* 5, herbaceous, acuminate; outer 3 the larger, ovate, decurrent on the peduncle and accrescent in fruit; inner 2 smaller, lanceolate, unaltered in fruit. *Corolla* wide-infundibiliform; tube hirsute externally except on spaces opposite the sepals, with 5 distinct vertical bands; limb sub-entire. *Stamens* 5, adnate to corolla-tube, included; filaments filiform. *Ovary* glabrous, 2-celled; ovules 4; style filiform; stigma 2-globose. *Fruit* a 2-celled, 4-valved capsule. *Seeds* 4, large, black, smooth.—DISTRIB. Species about 5, all confined to America but one, which is cosmopolitan in the tropics.

ANISEIA MARTINICENSIS, Choisy Convolv. Rar. 144. A slender herb creeping in wet places or climbing, glabrous or with a few adpressed hairs. *Leaves* oblong-lanceolate, apex obtuse with a mucro, base cuneate; glabrescent; ·75 to 3 in. long, ·5 to 1 in. wide; petiole ·6 in. long. *Flowers* axillary solitary; peduncles 1 in. long, with 2 minute, persistent bracts about the middle. *Sepals* unequal, the outer ovate-acute ·6 in. long, the inner narrower, green, glabrescent; in fruit accrescent at length ·75 to 1 in. long, the 2 outer then sub-cordate-ovate scarious, strongly nerved, decurrent on the peduncle; the inner lanceolate. *Corolla* white, campanulate, tube 1 in. long, pubescent outside; limb 1 in. across. *Capsule* ovoid, glabrous; ·5 in. long. *Seeds* with minutely strigose margins. Choisy in DC. Prod. IX. 430; Hallier f. Engl. Bot. Jahrb. XVIII. 96, and Bull. Herb. Boiss. V. 382. *A. uniflora*, Choisy Convolv. Or. 101, t. 2, f. 9, and in DC. Prod. IX. 431; Wight Ic. t. 850. *Convolvulus martinicensis*, Jacq. Am. 20, t. 17. *C. uniflorus*, Lamk Encyc. Meth. III. 544; Burm. Fl. Ind. 47, t. 21. *C. emarginatus*, Vahl Symb. III. 23. *C. Rheedei*, Wall. Cat. 1358; Roxb. Flor. Ind. ed. Carey & Wall. II. 70. *Ipomœa martinicensis*, Mez Prim. Fl. Esseq. 98. *I. uniflora*, Roem. & Schult. Symb. IV. 247; Clarke in Hook. f. Flor. Brit. Ind. IV. 201. *I. lanceolata*, G. Don Gen. Syst. IV. 282.

PERAK: Kwala Dipong, *Scortechini* 1780! Kota Bahru, *King's Collector* 1075! MALACCA: *Griffith!*—DISTRIB. Tropics generally.

10. JACQUEMONTIA, Choisy.

Climbing or twining herbs or undershrubs; stems and leaves usually pubescent. *Leaves* usually cordate or elliptic, entire or rarely toothed or lobed. *Flowers* axillary, in compound umbellate or capitate cymes, very rarely solitary; bracts small, rarely leafy. *Sepals* 5, equal or unequal. *Corolla* usually small; tube infundibuliform with a wide or narrow throat, and with 5 vertical bands each ending in 2 distinct nerves; limb plicate. *Stamens* 5, adnate to corolla-tube, included. *Ovary* glabrous, 2-celled; ovules 4; style filiform; stigmas 2, linear or elliptic-oblong. *Fruit* a globose 2-celled capsule, usually 8-valved, rarely 4-valved. *Seeds* normally 4, usually glabrous, often slightly winged along the margins.—DISTRIB. Species 60 to 70, mostly in Brazil; 2 to 3 in S.E. Asia.

JACQUEMONTIA PANICULATA, Hallier f. Engl. Bot. Jahrb. XVI. 541; XVIII. 95. A slender climber; stems twining, puberulous. *Leaves* ovate-cordate, acute, entire, pubescent beneath, puberulous at length glabrescent above, 1·5 to 3 in. long, 1 to 2 in. wide; petiole ·5 to 1 in. long. *Flowers* axillary, in small dense many-flowered sub-capitate cymes; peduncles puberulous, 1 to 1·5 in. long; bracts inconspicuous. *Sepals* 5, ovate-cordate, pubescent, ·25 in. long, not altered in fruit. *Corolla* tubular, ·5 in. long; mouth narrow, limb pink or white, shortly acutely 5-lobed. *Capsule* globose, glabrous, ·2 in. in diam. *Seeds* glabrous. *Convolvulus parviflorus*, Vahl. Symb. III. 29; Roxb. Flor. Ind. ed. Carey & Wall. II. 51; Choisy Convolv. Or. 98, and in DC. Prod. IX. 413; Clarke in Hook. f. Flor. Brit. Ind. IV. 220. *C. asclepiadeus*, Wall. Cat. 1396. *Ipomœa paniculata*, Burm. Flor. Ind. 50, t. 21, f. 3. *I. parviflora*, Pers. Synops. I. 183 (*not of* Vahl.).

PERAK: Kampong Kota, *Wray* 3337!—DISTRIB. Tropical Africa, S.E. Asia generally, Australia.

11. MERREMIA, Dennst.

Shrubs or herbs, usually climbing, rarely erect or prostrate; stems very rarely winged. *Leaves* entire, lobed, or divided. *Flowers* axillary, usually long-peduncled, solitary or in few-flowered, rarely many-flowered cymes; bracts small. *Sepals* 5, sub-equal, elliptic or lanceolate, acuminate, rarely rounded or truncate, convex, usually slightly accrescent in fruit. *Corolla* campanulate, white, less often yellow or orange, the tube with 5 vertical bands each usually marked by 5 dark-violet lines; limb plicate, margin slightly 5-lobed. *Stamens* 5, unequal, included or exserted; filaments filiform; anthers usually twisted; pollen never spinulose. *Ovary* 2-celled or occasionally 4-celled; ovules 4; style filiform; stigma 2-globose. *Fruit* a 4-valved capsule, 1–4-locular, sometimes the style separating with a small stopple. *Seeds* 4, rarely fewer, dull, glabrous, rarely puberulous.—DISTRIB. Species about 40, in all warm countries.

Corolla glabrous externally :—	
Leaves not peltate :—	
Leaves deeply 5-lobed ; flowers large	1. *M. vitifolia.*
Leaves entire or very slightly lobed ; flowers small :—	
Sepals acuminate ; flowers yellow with a pink or purple eye :—	
Leaves acute at apex	2. *M. hastata.*
Leaves obtuse, truncate, or 3-toothed at apex ..	3. *M. tridentata.*
Sepals obtuse : flowers without a distinct eye :—	
Leaves narrow-oblong, the lower often ovate-oblong ; flowers white with pinkish tinge or yellowish-white or pale yellow	4. *M. cæspitosa.*
Leaves ovate-cordate, margin often crenate or toothed ; flowers clear yellow	5. *M. convolvulacea.*
Leaves peltate ; flowers large	6. *M. nymphæifolia.*
Corolla somewhat hirsute or shaggy externally :—	
Leaves more or less hirsute ; flowers in compact corymbose or umbellate cymes	7. *M. umbellata.*
Leaves quite glabrous ; flowers in lax cymes	8. *M. crispatula.*

1. MERREMIA VITIFOLIA, Hallier f. Engl. Bot. Jahrb. XVI. 552. A large climber with slender hispidly hairy branches. *Leaves* cordate, palmately 5-lobed, 2 to 6 in. across ; lobes triangular acute, often toothed or again acutely lobed ; petiole ·5 to 2 in. long, hispidly hairy. *Flowers* in axillary 1–7-flowered cymes ; peduncles hispidly hairy, 1 to 4 in. long, pedicels hispidly hairy, ·2 to ·5 in. long. *Sepals* ovate-acute, hispid, ·5 in. long, in fruit somewhat enlarged, ·75 in. long. *Corolla* campanulate, clear yellow, glabrous, 1·5 in. long and nearly as wide, slightly irregular. *Capsule* depressed-globose, membranous, 2-celled, normally 4-seeded. *Seeds* glabrous. Verslag. Buitenzorg. 1895, 127, and Bull. Herb. Boiss. V. 379. *Convolvulus vitifolius*, Burm. Fl. Ind. 45, t. 18, f. 1 ; Linn. Mantiss. 203 ; Roxb. Hort. Beng. 14 ; Flor. Ind. I. 476, and ed. Carey & Wall. II. 61 ; Wall. Cat. 1348. *C. angularis*, Burm. Fl. Ind. 46, t. 19, f. 2 ; Linn. Mantiss. 203 ; Hassk. Pl. Jav. Rar. 519. *Ipomæa vitifolia*, Sweet Hort. Brit. ed. II. 372 ; Blume Bijdr. 709 ; Choisy Convolv. Or. 72, and in DC. Prod. IX. 361 ; Kurz For. Flor. Burm. II. 219 ; Clarke in Hook. f. Flor. Brit. Ind. IV. 213. *I. angularis*, Choïsy Convolv. Or. 72.

PERAK : Larut, *Scortechini !* ANDAMANS : Port Mouat, *Kurz !* Narcondam, *Prain !* NICOBARS : Nancowry, *Prain's Collector !*—DISTRIB. S.E. Asia generally.

2. MERREMIA HASTATA, Hallier f. Engl. Bot. Jahrb. XVI. 552. A diffuse twining biennial herb, stem angular. *Leaves* glabrous, hastate-lanceolate, 2 to 3 in. long, ·3 to ·5 in. wide, apex acute ; petiole very short. *Flowers* 1 to 3 on wiry axillary peduncles as long as or longer than the leaves ; bracts very small, lanceolate. *Sepals* narrow,

acuminate, ·3 to ·5 in. long, glabrous. *Corolla* funnel-shaped, ·6 in. long, pale yellow with a purple eye; limb slightly lobed. *Stamens* 5; filaments slightly hairy at the base; anthers straight. *Ovary* and style glabrous; ovary 2-celled, each cell 2-ovuled. *Capsule* ovoid, papery, glabrous, 2-celled. *Seeds* glabrous. Engl. Bot. Jahrb. XVIII. 117. *Convolvulus hastatus*, Desr. in Lamk Encyc. Meth. III. 547. *C. filicaulis*, Vahl Symb. III. 24. *C. denticulatus*, Spreng. Syst. I. 603. *C. medius*, Roxb. Flor. Ind. I. 474, and ed. Carey & Wall. II. 56; Wall. Cat. 1346 (*not of* Linn.). *C. Blumei*, Dietr. Syn. Pl. I. 675. *Ipomœa denticulata*, R. Br. Prod. I. 485; Bot. Reg. t. 317 (*not of* Choisy). *I. filicaulis*, Bl. Bijdr. 721; Choisy Convolv. Or. 66; DC. Prod. IX. 353. *I. Blumei*, Steud. Nomencl. I. 815. *I. angustifolia*, Clarke in Hook. f. Flor. Brit. Ind. IV. 205 (*not of* Jacq., *nor of* Choisy). Rheede Hort. Malab. XI. t. 55.

PERAK: Larut, *Scortechini* 138! 1833! Kwala, &c., *Wray* 859! 1751! Sungah Ryah, *King's Collector* 996! PENANG: Batu Gaja, &c., *Deschamps*! MALACCA: *Griffith!* Tanjong Kling and Bukit Bruang, *Hervey!* PAHANG: Pekan, *Ridley!* Katapang, *Ridley* 1236! SINGAPORE: *Hullett* 69! 232! *King's Collector* 1174! *King!*—DISTRIB. Throughout S.E. Asia, Tropical Africa, and Australia.

3. MERREMIA TRIDENTATA, Hallier f. Engl. Bot. Jahrb. XVI. 552. A diffuse glabrous herb with a woody rootstock giving off many closely decumbent elongated stems. *Leaves* glabrous, hastate-oblong, or spathulate-linear, or sub-quadrate, ·5 to ·8 in. long, ·15 to ·5 in. wide, apex obtuse truncate or 3-toothed; petiole 0. *Flowers* 1 to 3 on wiry axillary peduncles as long as or longer than the leaves; bracts very small, lanceolate. *Sepals* ovate, acuminate, ·25 to ·35 in. long. *Corolla* funnel-shaped, ·4 to ·5 in. long, yellow with pink eye; limb slightly lobed. *Stamens* 5. *Capsule* ovoid, papery, glabrous, 2-celled. *Seeds* glabrous. Engl. Bot. Jahrb. XVIII. 116. *Convolvulus tridentatus*, Linn. Sp. Pl. 157; Roxb. Fl. Ind. I. 475, and ed. Carey & Wall. II. 56; Wall. Cat. 1347. *Evolvulus tridentatus*, Linn. Sp. Pl. ed. II. 392. *Ipomœa tridentata*, Roth Cat. Bot. II. 19; Choisy Convolv. Or. 65, and in DC. Prod. IX. 353; Clarke in Hook. f. Flor. Brit. Ind. IV. 205.

MALACCA: *Griffith* 5861/1 (K.D.)! *Maingay* 1147 (K.D.)! JOHORE: Batu Pahat, *Ridley* 11,114!—DISTRIB. India generally, Africa, Bangka.

4. MERREMIA CÆSPITOSA, Hallier f. Engl. Bot. Jahrb. XVI. 552. A sparsely hairy or glabrescent annual or biennial slender twining or creeping herb. *Leaves* narrowly oblong, the lower often sub-cordate and ovate-oblong, sometimes slightly hastately lobed, 1·5 to 2·5 in. long, ·5 in. wide; petiole ·25 to ·5 in. long. *Flowers* cymose, few or many on slender peduncles 1 to 3 in. long; bracts minute, persistent. *Sepals* elliptic-obtuse, ·25 in. long, margins when dry often inflexed above.

Corolla sub-campanulate, ·75 in. long, white with a pinkish tinge or yellowish-white or yellow. *Ovary* 2-celled, each cell 2-ovuled. *Capsule* ovoid, ·25 in. long, papery, 1-celled, with only a trace of the original dissepiment near the base. *Seeds* glabrous. Bull. Herb. Boiss. V. 382. *Convolvulus cæspitosus*, Roxb. Hort. Beng. 14, Flor. Ind. I. 483, and ed. Carey & Wall. II. 70; Wall. Cat. 1357. *C. Benthamii*, Wall. Cat. 1393. *Hewittia cæspitosa*, Steud. Nomencl. Bot. ed. II. i. 757. *Skinneria cæspitosa*, Choisy Convolv. Or. 105, t. 6, and in DC. Prod. IV. 435. *Ipomæa linifolia*, Bl. Bijdr. 721; Choisy DC. Prod. IX. 369; Benth. Fl. Austr. IV. 423; Clarke in Hook. f. Flor. Brit. Ind. IV. 205. *I. setulosa*, Zoll. & Mor. Syst. Verzeichn. 51.

PERAK: Larut, *King's Collector* 2486! MALACCA: *Griffith!* SINGAPORE: *Kurz* 2976! *Hullett* 127! 387! *King! King's Collector* 1193!—DISTRIB. E. Himalaya, Indo-China, Malay Archipelago, Australia.

5. **MERREMIA CONVOLVULACEA**, Dennst. Schl. Hort. Malab. 39. A much-twining glabrous or casually hirsute often muricated herb. *Leaves* ovate-cordate, acute, glabrous, margin usually crenate or toothed, sometimes 3-lobed, 1 to 2 in. long, ·5 to 1 in. wide; petiole ·5 to 2 in. long. *Flowers* numerous, rather densely cymose, on axillary peduncles ·5 to 3 in. long; bracts small, caducous. *Sepals* elliptic, glabrous, ·2 in. long, ultimately sub-patent, margins often at length sub-involute. *Corolla* funnel-shaped, externally glabrous, yellow, ·5 to ·6 in. long. *Capsule* ovoid, sub-angular, at the apex rather thicker than elsewhere and often depressed, ·25 in. long; cells 2. *Seeds* puberulous. *M. hederacea*, Hallier f. Engl. Bot. Jahrb. XVIII. 168, and Verslag. Buitenzorg 1895, 126. *Evolvulus hederaceus*, Burm. Fl. Ind. 77, t. 30, f. 2. *Convolvulus flavus*, Willd. Sp. Pl. 852. *C. strictus*, Vahl Symb. III. 28. *C. dentatus*, Vahl Symb. III. 25; Roxb. Flor. Ind. ed. Carey & Wall. II. 62; Wall. Cat. 1349. *Ipomæa striata*, Poir. in. Lamk Encyc. Meth. Suppl. IV. 632 (*not of* Roth). *I. dentata*, Willd. ex Roem. & Schult. Syst. IV. 789. *I. subtriflora*, Zoll. & Mor. Verzeichn. 51.

PERAK: Durian, *King's Collector* 397! Larut, *Scortechini* 1832! PAHANG: Khol, *Ridley* 2168! JOHORE: Serom, *Ridley!* SINGAPORE: *Dorward!*—DISTRIB. S.E. Asia, Africa, Australia.

6. **MERREMIA NYMPHÆIFOLIA**, Hallier f. Verslag. Buitenzorg. 1895, 127. A large woody climber. *Leaves* orbicular-ovate, shortly acuminate, entire, glabrous on both surfaces, peltate with a rounded or slightly retuse base, 6 to 10 in. long, 5 to 8 in. wide, the floral leaves more deeply cut and at times cordate with a narrow sinus. *Flowers* large, in loose 4–15-flowered cymes on a common peduncle sometimes shorter

than the petioles, sometimes longer than the leaves. *Sepals* broad, obtuse, coriaceous, nearly equal, in flower ·75 in., in fruit nearly 1 in. long. *Corolla* wide-campanulate, 2 to 2·5 in. long, glabrous externally, yellow or white or purplish. *Stamens* 5; anthers hirsute. *Capsule* sub-globose, 1 in. in diam. *Seeds* pilose. *Ipomœa nymphæifolia*, Bl. Bijdr. 719; Prain Journ. As. Soc. Beng. LXIII, 2, 107. *I. Rumphii*, Miq. Flor. Ind. Bat. II. 605. *I. peltata*, Choisy, Convolv. Or. 70, and in DC. Prod. IX. 359; Miq. Flor. Ind. Bat. II. 605; Benth. Flor. Austral. IV. 408; Bak. Flor. Maurit. 208. *Convolvulus peltatus*, Linn. Sp. Pl. 1194. *Spiranthera peltata*, Boj. Hort. Maurit. 226. *Operculina peltata*, Hallier f. Engl. Bot. Jahrb. XVI. 549; XVIII. 119. *Chironia lanosanthera*, Nav. & Fernand. Vill. in. Blanco Flor. Fil. ed. III. Ic. II. t. 261, f. 1.

PERAK: Pangkor, *Scortechini* 1074! *Ridley* 7158!—DISTRIB. Mascarenes, S.E. Asia, Australia, Polynesia.

7. MERREMIA UMBELLATA, Hallier f. Eng. Bot. Jahrb. XVI. 552; VAR. *orientalis*, Verslag. Buitenzorg, 1895, 132, and Bull. Herb. Boiss. V. 381. A climbing softly hairy or almost glabrous shrub, stems often 15 to 20 feet long. *Leaves* cordate or hastate, elliptic or oblong, obtuse or shortly acute, entire or very rarely sinuate or angled, nerves rather distinct, softly hairy on both surfaces, or only beneath and glabrous except the nerves above, rarely quite glabrous above and only hairy on the nerves beneath; length 1·5 to 4 in., width 1 to 3 in.; petioles often softly hairy, ·2 to ·6 in. long. *Flowers* in compact corymbose cymes on axillary usually softly hairy peduncles ·5 to 1 in. long; pedicels ·2 to 1 in. long; bracts caducous. *Sepals* elliptic, obtuse, entire or mucronate, hairy or glabrous, ·25 to ·3 in. long. *Corolla* tubular-campanulate, white, or white with a yellow tinge, 1 to 1·5 in. long, lobes short, at first hirsute externally. *Capsule* globose, glabrous, ·3 in. wide. *Seeds* patently hirsute with blackish hairs. *Convolvulus blandus*, Roxb. Hort. Beng. 13; Flor. Ind. I. 470, and ed. Carey & Wall. II. 50, 70; Wall. Cat. 1342. *C. cymosus*, Lamk Encycl. Meth. III. 556. *C. pentagonus*, Roxb. Hort. Beng. 14, Flor. Ind. I. 485, and ed. Carey & Wall. II. 72; Wall. Cat. 1343. *C. Rothii*, Spreng. Syst. I. 600. *Ipomœa cymosa*, Roem. & Schult. Syst. IV. 241; Blume Cat. Gewachs. Buitenz. 50; Choisy Convolv. Or. 79, and in DC. Prod. IX. 371; Bot. Reg. 1843, t. 24; Clarke in Hook. f. Flor. Brit. Ind. VI. 211. *I. bifida*, Roth Nov. Sp. 118. *I. Heynei*, Roem. & Schult. Syst. IV. 237. *I. Rothii*, Roem. & Schult. Syst. IV. 241. *I. Olanda*, Sweet Hort. Brit. ed. II. 372. *I. caliginosa*, Choisy Convolv. Or. 79, and in DC. Prod. IX. 370.

PERAK: Thaipeng, *Scortechini!* Krian, *Scortechini!* Larut, *King's Collector!* PENANG: *Wallich! King! Deschamps!* SELANGOR:

Ridley! ANDAMANS: very common. NICOBARS: *Kurz! Prain!*—DISTRIB. E. and S.E. Asia, Tropical Africa.

VAR. *occidentalis*, Hallier f. Verslag. Buitenzorg 1895, 127. *Leaves* wide-cordate, softly hairy on both sides, 4 in. long, 3·5 in. wide; *cymes* umbellate; *corolla* yellow. *Convolvulus umbellatus*, Wall. Cat. 2329. *Ipomœa umbellata*, Mez Prim. Flor. Esseq. 99. *I. cymosa*, var. *culta*, Prain Journ. As. Soc. Beng. LXIII. 2, 108.

PERAK: Sungah Ryah, *Kunstler* 912!—DISTRIB. Bengal, naturalised; Tropical America.

8. MERREMIA CRISPATULA, Prain Beng. Pl. II. 730; VAR. *andamanica*, Prain. A large glabrous scandent herb. *Leaves* ovate-cordate, acuminate, margins entire or faintly undulate, glabrous on both surfaces, 3 to 4 in. long, 2·5 to 4 in. wide; petiole 1 to 1·5 in. long. *Flowers* in axillary few-flowered cymes; peduncles 1·5 to 2 in. long, pedicels ·75 to 1·25 in. long, thickened upwards. *Sepals* orbicular, ·5 in. long, in fruit ·75 in. long. *Corolla* campanulate, limb hardly lobed, tube hirsute externally, yellow, 1·25 in. long. *Capsule* suborbicular, ·75 in. across. *Seeds* minutely velvety, margins somewhat shaggy. *Ipomœa petaloidea*, var. *andamanica*, Prain Journ. As. Soc. Beng. LXIII. 2, 110.

ANDAMANS: S. Andaman, common.

This is in all probability specifically distinct from *Merremia crispatula* (*Ipomœa petaloidea*, Choisy), but it seems preferable to treat it for the moment as a variety of that species and not as a new species, because of its remarkable resemblance to *Merremia Riedeliana*, Hallier f. (*Ipomœa Riedeliana*, Oliv.), and *Merremia mammosa*, Hallier f. (*Ipomœa mammosa*, Choisy). From the former, as described and figured by Oliver, this differs in having a 4-celled ovary with 1 ovule in each cell, whereas *M. Riedeliana* has a 2-celled ovary with 4, sometimes 5, ovules in each cell. From *M. mammosa*, as figured by Rumphius, this differs in having obtuse calyx-lobes and a shaggy corolla; Rumphius' figure shows the sepals acute and the corolla glabrous. This plant appears to be the same thing as *Convolvulus platypeltis*, Span., from Timor, and if it proves to be distinct alike from *M. Riedeliana* and *M. mammosa*, which last is cited by Dr. Hallier as an Andaman plant, though we have no authentic example of *M. mammosa* from the Andamans at Calcutta, the name it should bear will be *Merremia platypeltis*.

12. OPERCULINA, Manso.

Large herbaceous climbers; stems, peduncles and petioles usually winged. *Leaves* large, entire or lobed, rarely peltate. *Flowers* large, showy, axillary, solitary or often in few-flowered cymes. *Sepals* 5, large, ovoid, glabrous, accrescent in fruit and ultimately irregularly splitting from the tip. *Corolla* infundibuliform, rarely campanulate; tube with 5 vertical smooth bands. *Stamens* 5; filaments filiform; anthers large, at length contorted; pollen never spinulose. *Ovary* 2-celled, glabrous; ovules 4; style filiform; stigma 2-globose. *Fruit* a capsule, not opening by valves; the epicarp circumscissile above the middle, the cap in separating carrying away the style; the endocarp at first entire, at length rupturing irregularly. *Seeds* usually solitary, rarely more than one, black, smooth or furred, usually large.—DISTRIB. Species 15, tropics generally.

Stems winged; bracts large, coloured; flowers white or pale yellow; leaves softly pubescent, not palmate .. .. .. 1. *O. Turpethum.*
Stems not winged; bracts small: flowers brilliant yellow; leaves glabrous, deeply palmately lobed .. .. .. 2. *O. tuberosa.*

1. OPERCULINA TURPETHUM, Manso En. Pl. Bras. 16, n. 49. A stout softly pubescent climber, with strong twining 4-angled or compressed less often sub-cylindric winged stems, wings membranous. *Leaves* large, ovate or oblong, obtuse or acute, 2 to 5 in. long, 1 to 3 in. wide, base cordate or truncate; petiole 1 in. long. *Flowers* axillary, in few-flowered cymes; peduncles 1 to 4 in. long; bracts oblong, 1 in. long, sometimes pinkish-purple, caducous. *Sepals* 5, ovate, softly pubescent, ·5 in. long; in fruit accrescent orbicular, concave, scarious and fissile, 1 in. long. *Corolla* white or pale yellow, tubular-campanulate, 1·5 in. long. *Stamens* 5, included, anthers at length contorted. *Capsule* globose, ·5 to ·75 in. across. *Seeds* 4 or fewer, glabrous. Hallier f. Engl. Bot. Jahrb. XVIII. 120, and Verslag. Buitenzorg, 1895, 128. *Convolvulus Turpethum*, Linn. Sp. Pl. 155; Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 57, and Flor. Ind. I. 476; Wall. Cat. 1371; Bot. Mag. t. 2093; Hassk. Pl. Jav. Rar. 518. *C. anceps*, Linn. Mantiss. 43. *C. triqueter*, Vahl Symb. III. 30. *Ipomæa Turpethum*, R. Br. Prod. I. 485; Bot. Reg. t. 279; Chois. Convolv. Or. 68, and in DC. Prod. IX. 360; Kurz For. Flor. Burm. II. 218; Clarke in Hook. f. Flor. Brit. Ind. IV. 212. *I. anceps*, Roem. & Schult. Syst. IV. 231; Bl. Bijdr. 714; Choisy Convolv. Or. 68, and in DC. Prod. IX. 360. *I. triquetra*, Roem. & Schult. Syst. IV. 231. *Spiranthera Turpethum*, Boj. Hort. Maurit. 226. *Argyreia alulata*, Miq. Flor. Ind. Bat. II. 587.

ANDAMANS: Narcondam, *Prain!* NICOBARS: Kamorta, *Kurz!* MALACCA: *Griffith!*—DISTRIB. E. Africa, S.E. Asia, Australia, Polynesia.

2. OPERCULINA TUBEROSA, Meissn. in Mart. Fl. Bras. VII. 212. A stout glabrous climber with strong twining smooth or muricate stems. *Leaves* large, ovate, deeply palmately lobed; lobes elliptic-lanceolate, acuminate, entire, 3 to 5 in. across; petiole 2 to 5 in. long. *Flowers* axillary in many-flowered cymes; peduncles 2 to 6 in. long; bracts deciduous; pedicels ·25 to 1 in. long. *Sepals* 5, elliptic-oblong, obtuse; accrescent in fruit and spreading, ultimately 2 in. long, 1 to 1·5 in. wide. *Corolla* yellow, tubular-campanulate, 2 in. long. *Stamens* 5, included,

anthers twisted. *Capsule* globose, ·3 in. wide; peduncle somewhat thickened. *Seeds* furred along the angles. Hallier f., in Engl. Bot. Jahrb. XVI. 476, 549; XVIII. 119; Verslag. Buitenzorg 1895, 128, and Bull. Herb. Boiss. VII. 410. *Ipomœa tuberosa*, Linn. Sp. Pl. 160; Choisy in DC. Prod. IX. 362 (*partly*).

SINGAPORE: *Hullett* 645, in cultivation.—DISTRIB. America, Africa, India, Malaya, New Caledonia.

LEPISTEMON, Bl.

Stout climbing herbs, with villous stems. *Leaves* cordate, often more or less lobed. *Flowers* in very dense axillary cymes; bracts narrow, deciduous. *Sepals* 5, sub-equal, herbaceous, hispid or glabrous, acute or obtuse. *Corolla* small, yellowish-white; tube hirsute externally, narrowed and shortly cylindric at base, urceolate above; limb shortly 5-lobed. *Stamens* 5, included; filaments dilated at their bases into 5 sub-equal, concave scales arched over the ovary; *disk* large cupular. *Ovary* 2-celled; ovules 4; style very short; stigma 2-partite, sub-capitate. *Fruit* a 4-valved capsule. *Seeds* glabrous.—DISTRIB. Species 3, S.E. Asiatic and African.

LEPISTEMON FLAVESCENS, Bl. Bijdr. 722. A climber with stout fulvous-villous stems. *Leaves* ovate-cordate, acute, entire or often distinctly 3-lobed, densely tawny-tomentose on both surfaces; 3 to 5 in. wide; petiole 1 to 2 in. long. *Flowers* yellowish-white in closely 10–30-flowered axillary cymes, sessile or on short peduncles ·25 to ·5 in. long; bracts tawny-hirsute, ·2 in. long, deciduous. *Sepals* 5, rather narrowly ovate to lanceolate, sub-acute to rather finely acuminate, densely patently sub-strigose, ·35 to ·4 in. long. *Corolla* narrow and hyaline at the base, membranous and from slightly to widely urceolate above; tube hirsute externally; limb widely infundibuliform. *Stamens* 5, the basal processes papillose or hirsute, included in the lower part of the corolla-tube and overarching the short style; filaments glabrous, included in the upper part of the corolla-tube. *Ovary* 2-celled; ovules 4; style very short; stigma 2-lobed, lobes sub-globose. *Capsule* ovoid, glabrous, 2-celled, 4-valved, ·25 in. long, normally 4-seeded. *Seeds* glabrous. Miq. Flor. Ind. Bat. II. 629; Prain Journ. As. Soc. Beng. LXIII. 2, 111; Wight Ic. t. 1362; Choisy in DC. Prod. IX. 348. *L. Wallichii*, Choisy Convolv. Or. 61, and in DC. Prod. IX. 348; Clarke in Hook. f. Flor. Brit. Ind. IV. 216. *Convolvulus cephalanthus*, Wall. Cat. 1402. *C. binectariferus*, Wall. in Roxb. Flor. Ind. ed. Carey & Wall. II. 47. *Vallaris controversa*, Spreng. Syst. cur. post. 65. *Ipomœa Wallichii*, Steud. Nomencl. Bot. *Nemodon* sp., Griff. Notul. IV. 286.

PERAK: Larut, *Scortechini* n. 1544! Goping, *King's Collector* 987! 1059!—DISTRIB. Assam, Tenasserim, Chittagong, Java, Borneo, Philippines.

The three gatherings from Perak agree with each other in every respect: They differ from the plant as it occurs in Tenasserim, in having a more widely urceolate corolla and even longer and more lanceolate sepals; at the same time they differ from the plant as it occurs in the Malay Archipelago, in having the sepals narrowly lanceolate and acuminate, instead of ovate and sub-acute. As regards corolla, however, they are exactly like the species as it occurs elsewhere in Malaya. Since the Perak plant combines the characters of the two previously recognised species—*L. Wallichii* with long acuminate sepals and *L. flavescens* with wide-urceolate corolla—it appears to afford conclusive proof of the suggestion already made by Clarke, *l.c.*, that the Assamese and the Malayan plants are no more than forms of one somewhat variable species. An Indian form occurs in Travancore; this has been characterised by Stapf as a distinct species, *L. leiocalyx*, probably quite justly, since the Travancore plant has quite glabrous and obtuse sepals: the same form occurs in Chittagong; otherwise, however, the Indian plant agrees with the forms reported from Indo-China and Malaya.

IPOMŒA, Linn.

Herbs, rarely shrubs, twining or prostrate, less often sub-erect or erect. *Leaves* alternate, entire lobed or divided. *Flowers* axillary, solitary or in cymes, the cymes rarely paniculate, or in terminal spikes; bracts various. *Sepals* 5, ovate or linear, equal or unequal. *Corolla* campanulate or infundibuliform; limb plicate, very slightly 5-lobed. *Stamens* 5, included or very rarely exserted; filaments filiform or dilated at the base, often somewhat unequal; anthers straight or contorted; pollen spinulose. *Ovary* 1–3-celled, rarely 4-celled; ovules 4, rarely 6; style filiform; stigma capitate, entire or 2–3-globose, rarely stigmas 2, linear. *Fruit* a 4–6-valved capsule, rarely indehiscent. *Seeds* 4, less often 6, rarely solitary, glabrous, bearded, or uniformly velvety or woolly.—DISTRIB. Species about 300, throughout the tropics.

Leaves softly pubescent or densely hirsute on both surfaces:—
  Leaves deeply 5–7-lobed; flowers densely capitate with a whorl of involucrant bracts .. .. .. 1. *I. Pes-Tigridis.*
  Leaves entire or slightly 3-lobed; flowers in congested cymes, with often one of the bracts foliaceous .. 2. *I. Leari.*
Leaves glabrous or only slightly hirsute or pubescent:—
  Leaves all deeply 5- or more-lobed, glabrous:—
    Leaves digitately 5-lobed, lobes nearly if not quite distinct at the base; flowers more or less white .. 3. *I. pulchella.*
    Leaves palmately 5–7-lobed, lobes not as a rule more than three-fourths cut to the base; flowers purplish-pink .. .. 4. *I. paniculata.*
  Leaves entire or slightly lobed or if (rarely) deeply lobed the lobes only 2:—
    Flowers in few-flowered axillary cymes:—
      Cymes corymbose and lax or flowers 2 or solitary:—

Terrestrial, firm-stemmed plants :—

Flowers purple :—

Leaves ovate-cordate, acute or acuminate, entire or more or less lobed :—

Cultivated species with tuberous edible roots, often without flowers, rarely with seeds .. 5. *I. Batatas.*

Wild plants or if grown in gardens with the roots not edible :—

Large stout climbers on bushes near sea-coasts; flowers large, 4 in. long; sepals obtuse .. .. 6. *I. illustris.*

Slender climbers; flowers never more than 1·5 in. long; sepals acute or acuminate :—

Climbing or trailing herbs on sea-beaches; flowers 1·5 in. long .. .. 7. *I. denticulata.*

Climbing herbs in gardens, or garden escapes; flowers ·5 in. long .. 8. *I. triloba.*

Leaves oblong, obtuse or 2-lobed; littoral sand-binding creepers .. .. .. 9. *I. Pes-Capræ.*

Flowers white or yellowish-white; leaves oblong or linear-oblong, emarginate, sometimes lobed, occasionally lyrate; littoral sand-binding creepers .. 10. *I. littoralis.*

Aquatic or palustrine herbs; stems soft, thick and spongy, trailing and rooting on wet mud or floating in ponds and ditches; flowers purple .. .. 11. *I. reptans.*

Cymes subumbellate, dense; flowers pale purple, or white with a darker purple eye .. .. 12. *I. sagittæfolia.*

Flowers in many-flowered rather condensed axillary panicles; flowers white, slightly tinged with pink .. 13. *I. staphylina,* VAR. *malayana.*

1. IPOMŒA PES-TIGRIDIS, Linn. Sp. Pl. 162. A hirsute twining herb; stems patently hirsute. *Leaves* hirsute on both surfaces, deeply 5–9-lobed, lobes elliptic, acuminate, narrowed at the base; length 1 to 5 in., width 1 to 4 in.; petiole 1 to 2 in. long. *Flowers* densely capitate, on axillary hirsute peduncles ·5 to 3 in. long; the heads surrounded by a whorl of fulvous-hirsute bracts, the outer ovate or elliptic-oblong with cuneate or rounded bases 1 in. long, the inner narrower acute ·5 to ·75 in. long. *Sepals* lanceolate, acute, tawny-hirsute, ·3 to ·5 in. long, scarcely altered in fruit. *Corolla* 1·25 in. long, sparsely strigose externally, infundibuliform with rather narrow tube and abruptly widened mouth, pink. *Capsule* ovoid, ·25 in. long, glabrous, chartaceous. *Seeds* minutely velvety. Roxb. Flor. Ind. ed. Carey & Wall. II. 93; Bl. Bijdr. 709; Wight Ic. t. 836; Choisy Convolv. Or. 73, and in DC. Prod. IX. 363; Clarke in Hook. f. Flor. Brit. Ind. IV. 204; Hallier f. Bull. Herb. Boiss. V. 379. *Convolvulus Pes-Tigridis*, Spreng. Syst. I. 592; Wall. Cat. 1374. *C. bryoniæfolius* Salisb. Prod. 125. *Convolvuloides palmata*, Moench. Meth. 452. Rheede Hort. Malab. XI. t. 59.

MALACCA: *Griffith!*—DISTRIB. Tropical Africa, S.E. Asia generally.

2. IPOMŒA LEARI, Paxt. Bot. Mag. VI. 267. A large hirsute climber, with perennial root. *Leaves* widely or deeply cordate, acute, entire or slightly 3-lobed, softly sparingly hirsute above, more densely beneath; length 3 to 6 in., width 2 to 5 in.; petiole hirsute, ·2 to 3 in. long. *Flowers* in congested 3–7-flowered cymes on axillary softly pubescent peduncles 3 to 7 in. long; bracts linear acuminate ·3 to ·4 in. long, with casually a foliaceous bract 1·5 in. long, ·3 to ·5 in. wide, with a cuneate, less often sub-cordate base, close to the flowers. *Sepals* lanceolate, acuminate, ·75 in. long, pubescent. *Corolla* abruptly campanulate from a narrow cylindric base, tube 2·75 to 3 in. long, purple-blue or mixed red and blue, changing with age. *Fruit* not seen. *I. congesta*, Prain Journ. As. Soc. Beng. LXIII. 2, 104 (*not of* R. Br.). *Pharbitis Learii*, Hook. Bot. Mag. t. 3928; Choisy in DC. Prod. IX. 343.

SINGAPORE: *Hullett!*—DISTRIB. Cultivated throughout the tropics, native of America.

Mr. Hullett, whose plant was probably an escape, notes on his specimen (*Hullett* 646): "January, 1885: blue convolvulus, wild? Have never seen it in seed."

3. IPOMŒA PULCHELLA, Roth Nov. Sp. 115. A glabrous twining herb. *Leaves* glabrous, digitate, 5-lobed, lobes ovate-acute, base cuneate, central largest 1·25 to 1·5 in. long, ·5 to ·75 in. wide, basal smallest ·5 to ·75 in. long, ·3 to ·5 in. wide; petiole glabrous, ·75 to 2 in. long. *Flowers* in axillary 1–3-flowered cymes; peduncles ·25 to 1·25 in. long; bracts minute, deciduous; pedicels ·5 in. long, with small ovate sub-persistent bracteoles below the middle. *Sepals* ovate, glabrous, ·2 to ·25 in. long, the inner obtuse, the outer sub-acute. *Corolla* campanulate, 2 in. long, white or with a tinge of rose. *Capsule* globose, glabrous, ·5 in. wide. *Seeds* villous. Wight Ic. 158; Choisy in DC. Prod. IX. 386. *I. palmata* Clarke in Hook. f. Flor. Brit. Ind. IV. 386 *in part* (*not I. palmata*, Forsk = *I. cairica*, Sweet).

MALACCA: *Maingay*. SINGAPORE: Tanglin, *Ridley* 5817!—DISTRIB. India, Indo-China.

Mr. Ridley's specimens may be from plants escaped from cultivation; they are noted as "from behind the stable, Tanglin." This is one of two species often cultivated in India under the name of the "Railway Creeper"; the other species so termed is the American *Merremia quinquefolia*, Hallier f.; the latter we have not yet received from the Malay peninsula, though it has already escaped and become domesticated near Port Blair in the Andamans.

4. IPOMŒA PANICULATA, R. Br. Prod. I. 486. A large scandent perennial climber with a tuberous root; stems glabrous. *Leaves* palmately 5–7-lobed, glabrous, the lobes sometimes cut almost to

the base, lanceolate or elliptic, often spathulate; length 3 to 7 in., width 2·5 to 6 in.; petiole 2 to 5 in. long. *Flowers* in many-flowered axillary cymes, on peduncles 2 to 6 in. long; pedicels ·25 to ·75 in. long; bracts deciduous. *Sepals* elliptic, shortly acute, glabrous, ·25 to ·3 in. long, enlarged and concave in fruit, ·4 to ·5 in. long. *Corolla* 1·5 to 2·25 in. long, glabrous externally, wide-campanulate, purplish-pink. *Stamens* 5, anthers straight. *Ovary* 4-celled for three-fourths of its height or throughout. *Capsule* ovoid, ·3 in. long, 4-celled throughout, 4-valved. *Seeds* woolly with long hairs which protrude from the chinks of the capsule. Bl. Bijdr. 709; Bot. Reg. t. 62; Hallier f. Bull. Herb. Boiss. V. 379. *Convolvulus paniculatus*, Linn. Sp. Pl. 223; Roxb. Flor. Ind. I. 478, and ed. Carey & Wall. II. 63; Wall. Cat. 1350; Spreng. Syst. I. 591. *C. platensis*, Spreng. Syst. I. 591. *C. insignis*, Spreng. Syst. I. 592. *C. roseus*, Kunth in Humb. & Bonpl. III. 108 (*not of* Miller). *Ipomœa digitata*, Linn. Syst. ed. X. 924; Meissn. in Mart. Fl. Brasil. VII. 278; Choisy in DC. Prod. IX. 389; Clarke in Hook. f. Flor. Brit. Ind. IV. 202. *I. mauritiana*, Jacq. Hort. Schoenbr. II. 39, t. 200. *I. gossypifolia*, Willd. Enum. Hort. Berol. 208. *I. eriosperma*, Beauv. Fl. Owar. & Benin II. 73, t. 105. *I. insignis*, Andr. Bot. Rep. t. 665; Bot. Reg. t. 75; Bot. Mag. t. 1790. *I. tuberosa*, G. F. W. Mey. Prim. Fl. Esseq. 102. *I. platensis*, Ker-Gawl. Bot. Reg. t. 333; Bot. Mag. t. 3685; Choisy in DC. Prod. IX. 387. *Batatas paniculata*, Choisy Convolv. Or. 54, t. 1, f. 2, and in DC. Prod. IX. 339; Wight Madr. Journ. Lit. IV. t. 11. *B. edulis*, var. γ, Choisy in DC. Prod. IX. 339.

PERAK: *Scortechini!* PENANG: *Wallich* 1350! *Deschamps!* SINGAPORE: Chan-chu-kang, *Ridley* 3909!—DISTRIB. Cosmopolitan in the tropics.

5. IPOMŒA BATATAS, Lamk Encycl. Meth. VI. 14. A trailing or twining glabrous or sparingly hairy herb with tuberous roots; tubers red, white, or occasionally yellow. *Leaves* ovate-cordate, acute, entire or angular or somewhat lobed; 2 to 4 in. long, 2 to 3·5 in. wide; petiole 2 to 5 in. long. *Flowers* in few-flowered cymes, very often none produced, on axillary peduncles 1 to 4 in. long; pedicels ·25 to ·5 in. long; bracts small, lanceolate, deciduous. *Sepals* narrowly oblong, acute, the outer shorter, ·5 to ·6 in. long. *Corolla* 1 to 2 in. long, purplish, glabrous externally, campanulate. *Stamens* 5, filaments slightly hirsute at the base. *Ovary* 4-celled, glabrous, half-enveloped by the undulate disk. *Capsule* 4-celled, or casually 3–1-celled by suppression. *Seeds* glabrous. Bl. Bijdr. 712; Meissn. in Mart. Fl. Brasil. VII. 282; Clarke in Hook. f. Flor. Brit. Ind. IV. 202; Hallier f. Bull. Herb. Boiss. V. 380. *I. Catesbæi*, G. F. W. Mey. Prim. Fl.

Esseq. 103. *Convolvulus Batatas*, Linn. Sp. Pl. 154; Roxb. Flor. Ind. I. 483, and ed. Carey & Wall. II. 69; Wall. Cat. 1356. *C. indicus*, Moris. Hist. II. sect. I. t. 3, f. 4. *C. edulis*, Thunb. Fl. Japon. 84. *C. esculentus*, Salisb. Prod. 123. *Batatas edulis*, Choisy Convolv. Or. 53, and in DC. Prod. IX. 338. *B. xanthorhiza* Boj. Hort. Maurit. 225. Rumph. Herb. Amboin. V. t. 130. Rheede Hort. Malab. VII. t. 50.

PERAK: Larut; *Scortechini* 1836! but doubtless also present in other provinces, cultivated.

The Sweet Potato; very rarely seen in flower, still more rarely in fruit. A native of America, but now grown throughout the tropics.

6. IPOMŒA ILLUSTRIS, Prain Beng. Pl. II. 735. A glabrous climber. *Leaves* ovate or oblong, cordate or hastate, entire, glabrous, apex acuminate; nerves rather prominent; 4 to 6 in. long, 3·5 to 5 in. wide; petiole 1·5 to 2 in. long. Flowers in axillary cymes; peduncles 1 to 1·5 in. long, usually 2–3-flowered, often 1-flowered; bracts caducous; pedicels ·5 to 1·5 in. long. *Sepals* orbicular, obtuse, glabrous, ·3 to ·4 in. long. *Corolla* rather wide-campanulate, purple, 4 to 4·5 in. long, glabrous, limb 3 in. wide. *Capsule* ·5 in. wide, globose. *Seeds* with long silky hairs. *I. campanulata* var. *illustris*, Clarke in Hook. f. Flor. Brit. Ind. IV. 211.

ANDAMANS: on the coasts, everywhere. PENANG: Pulo Boetong, *Curtis* 1970!—DISTRIB. Coasts of Ceylon, Sunderbuns, Indo-China, and Malay Archipelago.

This is very nearly allied to *I. campanulata*, Linn., which appears, however, to be always an inland species, whereas this is always a littoral plant. *I. illustris* differs further in having flowers at least one-half larger, sepals quite glabrous, and fewer flowers to the cyme.

7. IPOMŒA DENTICULATA, Choisy in DC. Prod. IX. 379 (*not of* R. Br.). A glabrous trailing or twining littoral herb. *Leaves* ovate-cordate, acute, entire denticulate angled or sub-lobate, base rather deep-cordate with an obtuse sinus, firm in texture but hardly fleshy; 1 to 2·5 in. long, ·75 to 1·75 in. wide; petiole 1·5 in. long. *Flowers* axillary on short 1–3-flowered peduncles, never more than 1·5 in. long; pedicels (often only one) 1 to 1·25 in. long; bracts ·2 in. long, linear. *Sepals* elliptic, abruptly acute, sub-scarious, ·4 in. long. *Corolla* 1·5 in. long, tube funnel-shaped, abruptly widening at the mouth, purple. *Ovary* 2-celled. *Capsule* globose, ·3 in. in diam., glabrous. *Seeds* smooth. Benth. Fl. Austr. IV. 421; Clarke in Hook. f. Flor. Brit. Ind. IV. 298; Hallier f. Engl. Bot. Jahrb. XVI. 554. *I. littoralis*, Bl. Bijdr. 713 Thw. Enum. 211 (*not of* Boiss.). *I. subdentata*, Miq. Fl. Ind. Bat. II. 614. *I. cymosa*, Bak. Fl. Maurit. 208 (*not of* Roem. & Schult.). *I.*

nicobarica, Kurz in Journ. As. Soc. XLV. 2, 141. *Convolvulus denticulatus*, Lamk Encycl. Meth. III. 540.

PERAK: Dindings, *Scortechini* 1066! *Curtis* 3449! PENANG: Bagian Jumal, *Curtis* 1974! PAHANG: Rumpin, *Ridley!* NICOBARS: common. ANDAMANS: very common.—DISTRIB. Coasts of the Indian and Pacific Oceans, from the Seychelles to Polynesia.

This species, in the writer's experience, prefers shingle beaches, though occasionally it is to be met with on sandy beaches along with *I. biloba*.

8. IPOMŒA TRILOBA, Linn. Sp. Pl. 229. A twining or prostrate herb with glabrous slightly angular stem. *Leaves* cordate, acuminate to an often rounded tip, entire or toothed or occasionally 3-lobed; 1·5 to 2 in. long, 1·25 to 1·75 in. wide; petiole slender, 1·75 to 2 in. long. *Flowers* in axillary 1–4-flowered cymes; peduncles 1 to 1·5 in. long; bracts lanceolate, ·2 in. long, deciduous; pedicels ·25 to ·35 in. long. *Sepals* lanceolate, acuminate, ciliate with spreading yellowish hairs, ·35 in. long. *Corolla* tubular, purple, ·5 in. long. *Capsule* pilose. Choisy in DC. Prod. IX. 383.

SINGAPORE: *Hullett!*—DISTRIB. Cultivated in the tropics; native of America.

Under his n. 68, Mr. Hullett sent to Calcutta, in 1884, as *Ipomœa coccinea*, a mixture of two species, one of which is *Quamoclit phœnicea*, the other being *Ipomœa triloba*; as they are not noted as cultivated it seems possible that *I. triloba* may at least casually occur as an escape at Singapore. For the detection of this mixture, which had not been observed by the writer when arranging the Calcutta *Convolvulaceæ* in 1894 (*see* Journ. As. Soc. Beng. LXIII. 2, 83 *et seq.*), we are indebted to Dr. H. Hallier.

9. IPOMŒA PES-CAPRÆ, Roth Nov. Sp. 109. A glabrous extensive sand-binding creeper. *Leaves* orbicular or oblong, obtuse emarginate or 2-lobed; 1 to 4 in. long and sometimes wider than long; thick, fleshy, when dry distinctly nerved; petiole 1 to 4 in. long. *Flowers* in axillary 1–3-flowered cymes; peduncles 1 to 4 in. long; bracts ·2 in. long, lanceolate, deciduous; pedicels ·75 to 1·5 in. long. *Sepals* ovate, obtuse, glabrous, ·5 to ·6 in. long, slightly enlarged in fruit. *Corolla* tubular-campanulate, glabrous, 2 in. long, purple. *Capsule* ovoid, glabrous, ·5 in. long. *Seeds* villous. Choisy Convolv. Or. 63, and in DC. Prod. IX. 349; Meissn. in Mart. Fl. Brasil. VII. 256; Hallier f. Bull. Herb. Boiss. V. 381. *I. biloba*, Forsk. Flor. Ægypt.-Arab. 44; Clarke in Hook. f. Flor. Brit. Ind. IV. 212. *I. maritima*, R. Br. Prod. 486; Bl. Bijdr. 720; Bot. Reg. t. 319. *Convolvulus Pes-Capræ*, Linn. Sp. Pl. 159; Roxb. Hort. Beng. 14, Flor. Ind. I. 486, and ed. Carey & Wall. II. 74; Wall. Cat. 1360. *C. maritimus*, Lamk Encyc. Meth.

III. 550. *C. bilobatus*, Roxb. Hort. Beng. 14, Flor. Ind. I. 485, and ed. Carey & Wall. II. 73; Wall. Cat. 1359. *Batatas maritima*, Boj. Hort. Maurit. 225. Rumph. Herb. Amboin. V. t. 159, f. 1. Rheede Hort. Malab. XI. t. 57.

PENANG: on the coast, *Deschamps!*—DISTRIB. Sea-shores of all tropical countries.

10. IPOMŒA LITTORALIS, Boiss. Fl. Orient. IV. 112. A glabrous or slightly puberulous sand-binding creeper. *Leaves* oblong, emarginate or lobed, often deeply so, and sometimes linear-oblong or linear or sub-lyrate, nerves very obscure; length 1·25 to 1·5 in., width ·25 to ·75 in.; petiole 1 in. long. *Flowers* in axillary 1–3-flowered cymes; peduncles 1 in. long; bracts ·2 in. long, linear-lanceolate, sub-persistent; pedicels in fruit slightly clavate, ·75 to 1 in. long. *Sepals* ovate-obtuse or ovate-lanceolate, ·6 in. long, obtuse with or without a terminal mucro. *Corolla* white or yellowish-white, 1·75 to 2 in. long, campanulate. *Capsule* ovoid, glabrous, ·4 in. long. *Seeds* villous. Hallier f. Engl. Bot. Jahrb. XVI. 555. *I. carnosa*, R. Br. Prod. 485; Benth. Fl. Austral. IV. 419; Clarke in Hook. f. Flor. Brit. Ind. IV. 213. *I. acetosæfolia*, Roem. & Sch. Syst. IV. 246; Meissn. in Mart. Fl. Brasil. VII. 255, t. 94. *I. longifolia*, Benth. Pl. Hartweg. 16; Bot. Reg. 1840, t. 21. *Convolvulus littoralis*, Linn. Sp. Pl. 227. *C. acetosæfolius*, Vahl Eclog. I. 18. *C. arenarius*, Vahl Symb. I. 18. *C. carnosus*, Spreng. Syst. I. 609. *C. stoloniferus*, Cyril. Pl. Rar. I. t. 5. *Batatas littoralis*, Choisy Convolv. Or. 124, and in DC. Prod. IX. 337. *B. acetosæfolia*, Choisy in DC. Prod. IX. 338.

MALACCA: *Griffith*. PAHANG: Rumpin, *Ridley!*—DISTRIB. Sea-shores of all tropical countries.

11. IPOMŒA REPTANS, Poir. Encyc. Meth. Suppl. III. 460. An annual glabrous aquatic, stems prostrate on mud or floating on the surface of ditches and pools, hollow and spongy, rooting at the nodes below. *Leaves* elliptic-oblong, or cordate or hastate or oblong or lanceolate, entire or angular or sub-lobate; 3 to 6 in. long, 1 to 2·5 in. wide; petiole 1 to 6 in. long. *Flowers* in axillary 1–5-flowered cymes; peduncles 2 to 7 in. long; bracts inconspicuous; pedicels 1 to 2 in. long. *Sepals* ovate, obtuse, glabrous or faintly puberulous, ·4 in. long. *Corolla* 2 in. long, purple, infundibuliform-campanulate. *Capsule* ovoid, glabrous, ·3 in. long, 2–4-seeded. *Seeds* glabrous or very minutely closely silky. Bl. Bijdr. 714; Choisy Convolv. Or. 62, and in DC. Prod. IX. 349; Hallier f. Bull. Herb. Boiss. V. 380. *I. aquatica*, Forsk. Flor. Ægypt.-Arab. 44; Clarke in Hook. f. Flor. Brit. Ind. IV. 210. *I. repens*, Roth Nov. Sp. 110; Bl. Bijdr. 713. *I. subdentata*, Miq. Flor. Ind. Bat. II. 614. *Convolvulus reptans*, Linn. Sp. Pl. 158; Roxb. Hort. Beng. 14. *C. repens*,

Vahl Symb. I. 17; Roxb. Fl. Ind. I. 432, and ed. Carey & Wall. II. 68; Wall. Cat. 1355 (*not of* Linn.). *C. Adansonii*, Lamk Encyc. Meth. III. 560. Rumph. Herb. Amboin. V. t. 155, f. 1. Rheede Hort. Malab. XI. t. 52.

ANDAMANS: Port Blair, *Prain!* and probably in some of the other provinces.—DISTRIB. Tropics of the Eastern Hemisphere.

12. IPOMŒA SAGITTÆFOLIA, Burm. Flor. Ind. 50. A perennial glabrous or at times pubescent or hirsute twining herb. *Leaves* ovate-cordate, acute, glabrous or sometimes pubescent, entire or sinuate, rarely lobed, basal lobes usually rounded; length 1 to 2·5 in., width ·75–2 in.; petiole 1 to 2 in. long. *Flowers* in axillary peduncled sub-umbellate cymes; peduncles ·5 to 7 in. long; bracts small, lanceolate, caducous; pedicels ·3 to ·5 in. long, in fruit thickened and clavate. *Sepals* ovate, sub-obtuse, slightly puberulous, ·2 in. long, when dry slightly muriculate externally. *Corolla* pale purple or white with a purple eye, 1·5 to 2 in. long; tube cylindric, limb abruptly explanate. *Capsule* ·25 to ·3 in. long, ovoid, 2–4-seeded. *Seeds* furred. *I. sepiaria*, Koen. ex Roxb. Hort. Beng. 14, Flor. Ind. I. 500, and ed. Carey & Wall. II. 90; Choisy Convolv. Or. 82, and in DC. Prod. IX. 370, Wight Ic. t. 838; Clarke in Hook. f. Flor. Brit. Ind. IV. 209. *I. striata*, Roth Nov. Sp. 111. *I. Heynei*, Wall. Cat. 1387. *Convolvulus maximus*, Vahl Symb. III. 26. *C. strictus*, Vahl Symb III. 27. *C. marginatus*, Lamk Encyc. Meth. III. 558. *C. sepiarius*, Wall. Cat. 1384. *C. incrassatus*, Wall. Cat. 1386. Rheede Hort. Malab. XI. t. 53.

KEDAH: at 100 feet elevation, *King's Collector* 1705! MALACCA: Merliman Road, *Derry* 353! SINGAPORE: *Ridley* 6660! 11261!—DISTRIB. S.E. Asia generally.

13. IPOMŒA STAPHYLINA, Roem. & Schult. Syst. IV. 249; var. *malayana*, Prain Journ. As. Soc. Beng. LXIII. 2. 106. A glabrous scandent shrub over 90 feet long. *Leaves* glabrous, rather thick, dull green on both surfaces, sub-acute rather prominently veined; 2·5 to 4 in. long; petiole 1 to 2 in. long. *Flowers* numerous in rather dense panicles, 2·5 in. long, 2 in. wide; peduncles ·5 to 1·5 in. long; bracts small, caducous; pedicels ·1 to ·25 in. long, mostly short. *Sepals* ovate, obtuse, glabrous, ·2 in. long. *Corolla* white, slightly tinged with pink; tube narrowly funnel-shaped throughout, 1 to 1·25 in. long, hardly ·3 in. wide at the throat, limb rather narrow, abruptly explanate. *Capsule* ovoid, sub-acute, ·3 in. long, 4-seeded. *Seeds* with long silky hairs. *Convolvulus polyanthus*, Wall. Cat. 1378. *Lettsomia sumatrana*, Miq. Flor. Ind. Bat. Suppl. 560.

PENANG: *Porter* (*Wallich* 1378)! PERAK: Larut, *Scortechini!* *King's Collector* 1119! 2538! 5091!—DISTRIB. Sumatra.

This is very like typical *I. staphylina*, a species widespread in India, but differs considerably in the shape and size of the corolla, that of true *I. staphylina* being wide-campanulate from a very short, narrow-cylindric base, usually ·5 to ·75, very rarely 1 in. long, and ·5 to ·75 sometimes 1 in. wide at the limb.

15. QUAMOCLIT, Mœnch.

Annual twining glabrous herbs. *Leaves* cordate and angled or lobed, occasionally divided. *Flowers* axillary, in few-flowered cymes; bracts small. *Sepals* 5, sub-equal or the outer rather the smaller; their apices often sub-aristate. *Corolla* pink or red, hypocrateriform, slightly irregular; tube slender or slightly infundibuliform; limb very slightly 5-lobed, spreading. *Stamens* 5, resupinate, much exserted; filaments unequal. *Ovary* glabrous 4-celled; ovules 4; style rather longer than the stamens; stigma 2-globose. *Fruit* a 4-celled 1-valved capsule, the septa thin, persistent. *Seeds* 4, black, dull, puberulous or glabrous.—DISTRIB. Species 7, mainly American, 2 now widely spread in the tropics of the Eastern Hemisphere.

Leaves ovate-cordate, entire or lobed	1. *Q. phœnicea.*
Leaves ovate, deeply pinnately divided into numerous linear segments	2. *Q. pinnata.*

1. QUAMOCLIT PHŒNICEA, Chois. Convolv. Or. 51, t. 1, f. 1. A weak climbing or sub-scandent herb. *Leaves* ovate-cordate acute, glabrous, entire or lobed; 2 to 3 in. long, 2 to 2·5 in. wide; petiole 2 to 4 in. long. *Flowers* in axillary lax few-flowered cymes; peduncles slender, 2 to 6 in. long; pedicels erect; bracts minute. *Sepals* 5, elliptic, abruptly acuminate, ·25 in. long, unchanged in fruit. *Corolla* dark-red, or variously in cultivated forms orange or yellow; tube slender, 1 in. long; limb salver-shaped, somewhat oblique, ·75 in. across. *Stamens* 5, exserted. *Capsule* smooth, ovoid, ·3 in. long, completely 4-celled with membranous persistent septa. *Seeds* pubescent. Choisy in DC. Prod. IX. 336; Hallier f. Bull. Herb. Boiss. V. 1042. *Convolvulus phœniceus*, Spreng. Syst. I. 596; Wall. Cat. 1372. *Ipomœa phœnicea*, Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 92, and Flor. Ind. I. 502. *I. coccinea*, Clarke in Hook. f. Flor. Brit. Ind. IV. 199.

SINGAPORE: *Hullett!*—DISTRIB. Widely naturalised throughout S.E. Asia, native of America.

This, as Dr. Hallier notes on a sheet in Herb. Calcutta, is much larger and more vigorous in all its parts than is *I. coccinea*, with which it is usually confounded in Eastern collections; it differs besides in having erect and not nodding pedicels. *I. coccinea* is not, so far as is known, semi-spontaneous anywhere in S.E. Asia; the present species is now very widespread there in a wild condition.

2. QUAMOCLIT PINNATA, Boj. Hort. Maurit. 224. A slender glabrous twining herb. *Leaves* ovate in outline, deeply pinnately divided into

numerous distant linear segments, glabrous ; 3 to 5 in. long, 2 to 3 in. wide ; petioles 1 to 3 in. long. *Flowers* in axillary lax few-flowered cymes ; peduncles slender, 2 to 4 in. long ; pedicels erect, if more than one virgate ; bracts minute. *Sepals* 5, elliptic, ·25 in. long, hardly changed in fruit. *Corolla* dark red, occasionally in cultivated varieties white ; tube slender, 1 in. long ; limb salver-shaped, somewhat oblique, ·75 in. across. *Stamens* 5, exserted. *Capsule* smooth, ovoid, ·3 in. long, completely 4-celled with membranous persistent septa. *Seeds* puberulous. Hallier f. Engl. Bot. Jahrb. XVIII. 154. *Q. vulgaris*, Choisy Convolv. Or. 52, and in DC. Prod. IX. 336. *Convolvulus pinnatus*, Desr. in Lamk Encyc. Meth. III. 567. *C. Quamoclit*, Spreng. Syst. I. 591 ; Wall. Cat. 1375. *Ipomœa Quamoclit*, Linn. Sp. Pl. 159 ; Bot. Mag. t. 244 ; Bl. Bijdr. 708 ; Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 93, and Flor. Ind. I. 502 ; Clarke in Hook f. Flor. Brit. Ind. IV. 199.

PENANG : Batu Gaja jungles, *Deschamps !*—DISTRIB. Widely naturalised in S.E. Asia, native of America.

16. CALONYCTION, Choisy.

Large herbaceous climbers, stems usually muricate. *Leaves* large, cordate, entire or angled. *Flowers* solitary or in few-flowered axillary cymes ; bracts caducous. *Sepals* 5, herbaceous, smooth, usually aristate, sub-equal or the outer smaller. *Corolla* large, salver-shaped, white or rose-purple ; tube narrow-cylindric ; limb plicate. *Stamens* 5, adnate to corolla-tube, considerably exserted. *Ovary* glabrous, 2-locular ; ovules 4 ; style filiform ; stigma 2-globose. *Fruit* a 4-valved capsule. *Seeds* 4, dull, glabrous.—Species 6 to 7, all tropical American, 2 now widespread and sub-spontaneous in the tropics of the Eastern Hemisphere.

CALONYCTION BONA-NOX, Boj. Hort. Maurit. 227. A large climber, stems smooth or muricate, glabrous. *Leaves* ovate-cordate, acute, glabrous, entire or casually lobed ; 3 to 8 in. long, 2 to 4 in. wide ; petiole 3 to 6 in. long. *Flowers* on axillary 1–5-flowered peduncles, 2 to 6 in. long ; bracts caducous. *Sepals* 5, usually ovate, obtuse with a mucro, very slightly enlarged in fruit, glabrous ; ·5 in. long. *Corolla* 3 in. long ; tube linear, ·2 in. wide ; limb salver-shaped, 3 to 5 in. wide, white. *Stamens* 5, slightly unequal, distinctly exserted. *Capsule* ovoid-oblong, narrowed upwards, 1 in. long ; peduncle in fruit slightly thickened. *Seeds* glabrous. Hallier f. Bull. Herb. Boiss. V. 1028. *C. noctilucum*, Don in Sw. Hort. Brit. ed. III. 482. *C. speciosum*, Choisy Mem. Soc. Gen. VI. 441, t. 1, f. 4, and in DC. Prod. IX. 345 ; Hallier f. Engl. Bot. Jahrb. XVI. 556 ; XVIII. 153. *C. Roxburghii*, G. Don Gen. Syst. IV. 263. *Convolvulus aculeatus*, Linn. Sp. Pl. ed. I. 155. *C. bona-nox*

Spreng. Syst. I. 600. *C. grandiflorus*, Linn. f. Suppl. 136; Willd. Sp. Pl. I. 2. 859; Pers. Synops. I. 179; Wall. Cat. 1370. *C. latiflorus*, Desr. in Lamk Encyc. Meth. III. 561. *Ipomœa bona-nox*, Linn. Sp. Pl. ed. II. 228; Roem. & Schult. Syst. IV. 217; Bl. Bijdr. II. 712; Kurz For. Fl. Burm. II. 217; Clarke in Hook. f. Flor. Brit. Ind. IV. 197. *I. grandiflora*, Lamk Ill. I. 467, and Encyc. Meth. III. 16; Roem. & Schult. Syst. IV. 240; Roxb. Hort. Beng. 14, Flor. Ind. ed. Carey & Wall. II. 87, and Flor. Ind. I. 497. *I. Roxburghii*, Steud. Nomencl. ed. II. 1, 819. *I. noctiflora*, Griff. Not. IV. 286.

PENANG: cultivated, *Hallier*. SINGAPORE: *S. Mayer* 211.—DISTRIB. Throughout the tropics; possibly not truly wild in our area.

17. ARGYREIA, Lour.

Climbing rarely sub-erect shrubs. *Leaves* cordate to lanceolate, pubescent or silky. *Flowers* axillary, usually in many-flowered cymes, often sub-capitate; bracts often conspicuous. *Sepals* 5, herbaceous in flower; in fruit leathery but little enlarged; often red within. *Corolla* funnel-shaped, rose-purple, tube more or less hirsute externally; limb plicate, shortly 5-lobed. *Stamens* 5, included; anthers oblong, straight. *Disk* annular. *Ovary* 4-celled; ovules 4; style filiform; stigma 2-globose. *Fruit* a hard dry berry. *Seeds* 4 or fewer, embedded in a mealy pulp.—DISTRIB. Species about 30, in the tropics of the Old World chiefly, and mostly in S.E. Asia and Polynesia.

ARGYREIA OBTUSIFOLIA, Lour. Flor. Cochin-Chin. 135. A large climber. *Leaves* elliptic or oblong, acute or obtuse, with or without a sub-mucronate tip, base cuneate or occasionally rounded, upper surface pilose, under surface silky strigose, nerves 9 to 11 pairs, often rather distinct beneath, very oblique even in wide-leaved plants; length 5 in., breadth 1·5 to 3 in.; petiole ·6 to ·8 in., very rarely 1 to 1·5 in. long. *Flowers* axillary; peduncles usually short, ·6 to 1 in., but occasionally 1·5 to 3 in. long; cymes sub-capitate, the pedicels ·1 to ·2 in. long; bracts ovate, ·15 to ·2 in. long, caducous. *Sepals* 5, ovate-obtuse, ·25 in. long, densely silky-strigose externally, sub-patent in fruit, pale red within. *Corolla* 1·5 in. long, tubular-campanulate, densely uniformly hirsute externally. *Capsule* ·4 in. in diam., globose, pericarp chartaceous, pink. *Seeds* finely grey-velvety, hemispheric, ·2 in. in diam. Choisy in DC. Prod. IX. 333. *Convolvulus obtectus*, Wall. Cat. 1416. *Rivea ? obtecta*, Choisy, Convolv. Or. 28, and in DC. Prod. IX. 326. *Argyreia Championi*, Benth. Fl. Hongkong, 236. *A. obtecta*, Clarke in Hook f. Flor. Brit. Ind. IV. 186. *Lettsomia Championi*, Benth. & Hook. f. Gen. Pl. II. 869.

PERAK: *Scortechini* 1384! KEDAH: Langkawi, *Curtis* 2852!—

DISTRIB. Indo-China, from the Andamans and Tenasserim to Cochin China, Hongkong.

The two varieties distinguished in the *Flora of British India* can no longer be maintained in view of the large suites of specimens reported of late years from the Andamans, where the species is exceedingly common.

18. LETTSOMIA, Roxb.

Scandent, more or less hirsute or strigose shrubs. *Leaves* cordate rounded or truncate. *Flowers* in axillary, peduncled, corymbose or capitate cymes; bracts conspicuous. *Sepals* 5, orbicular or elliptic; somewhat thickened and coriaceous in fruit. *Corolla* usually pink; tube infundibuliform-campanulate; limb plicate, very shortly 5-lobed. *Stamens* 5, exserted or included; anthers oblong or linear, straight. *Disk* annular or cupular. *Ovary* 2-celled; ovules 4; style filiform; stigma 2-globose. *Fruit* a dry berry. *Seeds* 4 or fewer, embedded in a mealy pulp.—DISTRIB. Species about 40, in tropical Africa and S.E. Asia.

There is not, as the writer has already explained (*Journ. As. Soc. Beng.* LXIII. 2, 91), any very good reason for retaining *Lettsomia* as a genus apart from *Argyreia*. In *Argyreia* the ovary is completely 4-celled; in *Lettsomia* it is 2-celled, but not infrequently a partial dissepiment of smaller or larger size is to be found at the base of, sometimes half-way up, the cell.

Capsule chartaceous; seeds usually 4, only casually fewer; leaves cordate, softly hairy; cymes capitate; bracts large, elliptic-oblong, sub-persistent .. .. .. 1. *L. peguensis.*

Capsule coriaceous or sometimes somewhat fleshy; seeds usually 1, only casually 2:—

  Cymes compact; bracts large, persistent:—

    Cymes capitate, globose; bracts purple, large, orbicular-obtuse; leaves ovate-lanceolate, sparingly adpressed-hirsute 2. *L. sphærocephala.*

    Cymes sub-capitate, hardly globose; bracts ovate or ovate-lanceolate, acute; leaves ovate or elliptic, base rounded or shortly cuneate:—

      Corolla 2·25 in. long; leaves chartaceous, glabrous and shining above, a few hairs on petiole and midrib beneath .. .. 3. *L. Maingayi.*

      Corolla 1·25 in. long; leaves firmer, glabrous not shining above, hirsute beneath:—

        Leaves hirsute, more especially on the nerves, beneath; petioles sparingly hairy .. .. .. 4. *L. Ridleyi.*

        Leaves densely hirsute beneath throughout; petioles densely hairy .. .. 4*a*. *L. Ridleyi,* VAR. *velutina.*

  Cymes lax; bracts small, rarely with a casual foliaceous bract in a cyme, and usually caducous:—

    Sepals narrowly lanceolate, acute, spreading or sub-reflexed in fruit; bracts lanceolate, occasionally one large and leaf-like; leaves elliptic, softly hairy on both surfaces .. .. 5. *L. adpressa.*

- Sepals ovate or orbicular, obtuse or rarely some of them emarginate; bracts minute, usually caducous; leaves glabrous above :—
  - Sepals irregular, the three outer entire rounded, sparingly hairy, the two inner wider deeply emarginate, all closely embracing the base of the fruit; leaves elliptic shortly acuminate, sparingly adpressed-pubescent beneath .. .. 6. *L. Curtisii.*
  - Sepals regular or nearly so, all entire :—
    - Corolla 1·5 to 1·75 in. long :—
      - Sepals sub-equal, at length almost glabrous and somewhat spreading in fruit; leaves elliptic-oblong, chartaceous, glabrous or very sparingly pubescent beneath .. .. 7. *L. penangiana.*
      - Sepals persistently adpressed grey-pubescent outside, the inner rather larger than the outer, closely embracing the base of the fruit; leaves ovate-acute, firm, sparsely hirsute with rusty hairs beneath .. 8. *L. Scortechinii.*
    - Corolla ·5 to ·75 in. long; leaves elliptic acuminate; sepals closely embracing the base of the fruit :—
      - Leaves densely tawny-tomentose beneath; sepals all softly tawny-velvety, the inner rather the smaller; corolla ·75 in. long .. .. 9. *L. rubicunda.*
      - Leaves sparingly strigose-hirsute beneath; sepals sub-equal, the outer pubescent, the inner at length almost glabrous .. .. 10. *L. Kunstleri.*

1. Lettsomia peguensis, Clarke in Hook. f. Flor. Brit. Ind. IV. 193. A large climber, sometimes 50 feet long, with villous stems and branches. *Leaves* ovate, ovate-lanceolate or sub-orbicular, apex acute, base cordate; both surfaces densely softly hairy, tomentum fulvous but not acicular; length 4 to 6 in., width 1·5 to 3·5, rarely 5 to 6 in.; petiole 1·5 to 4 in. long. *Flowers* in axillary capitate cymes; peduncles 5 to 9 in. long; bracts sub-persistent, densely softly hairy, elliptic-oblong, 1 in. long. *Sepals* 5, the outer elliptic acute, rather larger than the inner lanceolate, densely hispid; ·5 to ·7 in. long. *Corolla* infundibuliform-campanulate, softly sparsely hairy externally, 2 in. long; limb and upper two-thirds of tube bright pink, base of tube nearly or quite white. *Berry* when ripe glossy brown, sub-globose, thin-walled, ·25 in. across. *Seeds* usually 2 or 4. Prain Journ. As. Soc. Beng. LXIII. 2, 94. *L. strigosa*, Roxb. Hort. Beng. 13, ex Wall. Cat. sub. n. 1404. *L. capitata*, Miq. Flor. Ind. Bat. II. 591. *Argyreia capitata*, Choisy in DC. Prod. IX. 332, *partly and excluding var. β. conferta:* Kurz For. Flor. Burm. II. 216 *mainly*. *Convolvulus strigosus*, Wall. Cat. 1365/2, 1365/c, and 1365/E *partly*. *C. barbiger*, Wall. Cat. 1404/1, 1404/2 *in part*. *Argyreia barbigera*, Choisy Convolv. Or. 42, and in DC. Prod. IX. 332.

PERAK: Batu Kuran, *Scortechini* 1628! near Goping, *King's Collector* 1077! Larut, *King's Collector* 2622! near Ulu Kerling, *King's Collector* 8627! PENANG: Bateh Pulo, *Deschamps!* SELANGOR: Woods at Gua Batu, *Ridley* 8210! 8227! 10194!—DISTRIB. Burma, Tenasserim, Sumatra, Java.

Probably only a geographical form of *Lettsomia strigosa*, Roxb., which is widespread in Indo-China and extends to S. China.

2. LETTSOMIA SPHÆROCEPHALA, Prain Journ. As. Soc. Beng. LXXIII. 2, 19. A shrubby climber; branches irregularly angled, with ridged bark brownish on young shoots, pale straw-coloured on older twigs, sparingly beset with adpressed acicular hairs. *Leaves* ovate-lanceolate, apex acute, base rounded, purplish beneath, very sparingly beset on both surfaces with adpressed hairs; length 4 to 5 in., width 1·5 to 2 in.; petiole 1 to 1·25 in., sparsely pubescent above with adpressed hairs. *Flowers* in compact capitate globose cymes 1·5 to 2 in. across, on long slender peduncles 2 to 12 in. long, sparingly adpressed-pubescent, surrounded by large orbicular purple involucrant sessile bracts 1·5 in. across, sparsely hirsute externally, quite glabrous internally, the individual flowers enveloped in similar but smaller sub-orbicular to spathulate bracteoles ·5 in. long, ·25 to ·5 in. wide; pedicels short adpressed-setose. *Sepals* glabrous externally except at their setose apices, the outer sub-acute, the inner wider obtuse ·25 in. long. *Corolla* ·75 to 1 in. long, infundibuliform-campanulate, pink, softly adpressed-hirsute externally. *Berry* not seen. *Argyreia sphærocephala*, Prain MSS.

PERAK: Krian, Abu Salama, Gunong Haran Ryah, *Scortechini!*

A very striking and remarkable species. The corollas do not appear to be full-sized. Scortechini, on the ticket of his Gunong Haran Ryah specimens, has written "fruit from Maxwell's Hill," but unfortunately the fruiting specimens alluded to are not at Calcutta.

3. LETTSOMIA MAINGAYI, Clarke in Hook. f. Flor. Brit. Ind. IV. 195. A large slender climber; branches slender or stoutish, with spreading setulose hairs. *Leaves* ovate or elliptic, base rounded or very shortly cuneate, apex acute or shortly caudate-acuminate, papery, glabrous and shining on both surfaces except for a few hairs on the midrib beneath; length 5 to 7 in., width 3 to 4 in.; lateral nerves 5 to 7; petioles ·5 to 1 in. long, very sparsely setulose. *Flowers* in axillary few-flowered cymes 2 to 3 in. wide; peduncles ·25 to 2 in. long, rather closely hirsute with tawny spreading hairs; bracts ovate-lanceolate, 1·5 in. long, ·6 in. wide, rather strongly parallel-nerved, sparingly hirsute externally, glabrous and dark purple within; bracteoles similar but smaller, ·3 in. long. *Sepals* linear-lanceolate, long-acuminate, ·75 in.

long, beset with long setulose hairs. *Corolla* tubular-campanulate, purple with whitish folds, 2·25 in. long; hairy externally. *Stamens* with filaments glandular-hairy at the thickened base. *Berry* ellipsoid, succulent, ·75 in. long, ·5 in. wide. *Seed* solitary.

MALACCA: *Griffith, Maingay, Derry* 318! *Goodenough*.1432! PERAK: *Scortechini* 297!

A very distinct species. There is no fruiting specimen in Herb. Calcutta; the above description of the berry is taken from the *Flora of British India*.

4. LETTSOMIA RIDLEYI, Prain Journ. As. Soc. Beng. LXIII. 2, 93. A large climber; branches sparingly hirsute. *Leaves* elliptic-acuminate, quite glabrous above, hirsute especially on the nerves beneath; 5·5 in. long, 3·5 in. wide; petiole 1 to 3 in. long, sparsely hirsute. *Flowers* in compact sub-capitate 8–10-flowered cymes 1·5 in. across, surrounded by large ovate-acute sessile foliaceous persistent bracts hirsute below, quite glabrous above, ·8 in. long, ·25 in. wide; bracteoles similar but smaller, ·3 in. long; peduncles 2 to 6 in. long, hirsute. *Sepals* sub-equal, ovate-lanceolate, externally pubescent, ·3 in. long. *Corolla* pink, infundibuliform-campanulate, 1·25 in. long, tube hirsute externally. *Berry* ovoid, ·5 in. long, ·3 in. in diam., the sepals spreading from its base.

JOHORE: Kota Tinggi, *Ridley* 4214! Chin-chin, *Lake & Kelsall!* SINGAPORE: Bukit Mandai, *Ridley*!

VAR. *velutina*, Prain l.c. *Leaves* beneath densely hirsute, as are the petioles, pedicels, and bracts externally.

SINGAPORE: Bukit Mandai, *Ridley*!

Nearest to *L. sphærocephala*, but distinguished by the acute bracts and bracteoles, nd to *L. Maingayi*, from which it differs by the smaller flowers and shorter bracts and sepals. VAR. *velutina* in foliage and tomentum remarkably resembles *L. rubicunda*, but the acute sepals and large persistent bracts and bracteoles amply distinguish it.

5. LETTSOMIA ADPRESSA, Miq. Flor. Ind. Bat. II. 591. A scandent shrub; branches hirsute; stems 10 to 30 feet long. *Leaves* elliptic, softly hirsute on both surfaces; base rounded or cuneate, apex acute; length 4 to 5 in.; width 2 to 2·5 in.; petiole 1·5 in. long, softly hirsute. *Flowers* in axillary few-flowered, somewhat open cymes 2 in. across; peduncles ·5 to 1·5 in. long, hirsute; bracts lanceolate, hirsute, ·3 in. long, ·15 in. wide, with an occasional longer leaf-like bract; bracteoles small. *Sepals* ·3 to ·5 in. long, narrowly lanceolate, sparingly hirsute, spreading or sub-reflexed in fruit. *Corolla* tubular-campanulate, dull claret, or pale pink and white, or white with claret stripes, externally hairy; tube 1·25 in. long. *Berry* ellipsoid, ·5 in. long, ·3 in. wide, at first green with a reddish tint, becoming bright pink, and at length, when quite ripe, reddish-brown. Clarke in Hook. f. Flor. Brit. Ind. IV. 196.

Convolvulus adpressus, Wall. Cat. 1424. *Moorcroftia adpressa*, Choisy Convolv. Or. 49, and in DC. Prod. IX. 334.

PENANG: *Porter! Kunstler* 1324! 5271! *Curtis* 318! MALACCA: *Maingay!* PERAK: *Scortechini* 1280! *King's Collector* 2457! 5400! *Wray* 1914! 3298! 3961!

6. LETTSOMIA CURTISII, Prain Journ. As. Soc. Beng. LXIII. 2, 100. A climber with brown glabrous branches. *Leaves* elliptic, shortly acuminate, glabrous except for a few hairs on the midrib above, sparingly adpressed-hirsute beneath; length 4 to 5 in., width 2·5 to 3 in.; petiole 2 to 3 in. long, glabrous. *Flowers* in axillary compound sub-umbellate cymes, 3 in. wide, 12–16-flowered; peduncles 4 to 10 in. long, brown, glabrous; bracts deciduous. *Sepals* coriaceous, ·25 in. long, the three outer sparingly hirsute, rounded, entire, the two inner wider, deeply emarginate, glabrous. *Corolla* not seen. *Berry* ovoid, succulent, ·75 in. long, ·5 in. wide, lower third closely embraced by the sepals.

SELANGOR: Kwala Lampar, *Curtis* 2158!

A very distinct species, easily differentiated by its emarginate inner sepals.

7. LETTSOMIA PENANGIANA, Miq. Flor. Ind. Bat. III. 592. A climber with very slender stems sometimes 100 feet long, young branches thin, fulvous-tomentose, soon becoming glabrous. *Leaves* elliptic-oblong, base rounded or cuneate, apex acute or sub-acute, papery, medium green glabrous above, very light green and glabrous or sparingly adpressed-pubescent and more closely hairy on the midrib beneath; 6 in. long, 2·5 in. wide; petiole ·5 to 1 in., glabrous. *Flowers* in lax axillary cymes 2 to 3 in. across, the terminal flower usually longer than the others; peduncles slender, 2 to 6 in. long, very sparsely hirsute, soon glabrous; pedicels ·3 to ·7 in. long, slender, hirsute; bracts minute. *Sepals* ovate-obtuse, sparingly hairy and at length glabrescent, ·2 in. long, at length spreading or sub-reflexed. *Corolla* tubular-campanulate, externally hirsute, bright claret or purple within, paler without, 1·5 to 1·75 in. long. *Berry* ovoid, ·6 in. long, ·3 in. wide, rose-pink, reddish-blue, or purple. Clarke in Hook. f. Flor. Brit. Ind. IV. 196; Prain Journ. As. Soc. Beng. LXIII. 2, 99. *Convolvulus penangianus*, Wall. Cat. 1425. *Moorcroftia penangiana*, Choisy Convolv. Or. 50, t. 4., and in DC. Prod. IX. 335.

PENANG: *Porter! Curtis* 1586! PERAK: very common; *Scortechini* 1147! *Wray* 2061! 2095! 2334! 2733! *Curtis* 2034! *Derry! King's Collector* 1936! 2048! 2574! 3223! 5339!

VAR. *reticulata*, Prain Journ. As. Soc. Beng. LXIII. 2, 100. Leaves thicker, secondary nerves beneath very distinct.

PERAK: Larut, *King's Collector* 8544!

The leaves of this species are very characteristically glandular-punctate beneath. The peduncles and pedicels of VAR. *reticulata* are rather shorter than in the type and the corolla, described by Kunstler as "waxy white, pale blue inside," is only two-thirds the length and only half the width of that of *L. penangiana* proper. But the leaves have the same characteristic glandular punctulation and are similarly sparingly adpressed-pubescent beneath, while the fruit, described by Kunstler as a rich pink, is indistinguishable from that of *L. penangiana*. This form, therefore, though very distinct, cannot yet be more than varietally separated.

8. LETTSOMIA SCORTECHINII, Prain Journ. As. Soc. Beng. LXIII. 2, 98. A strong climber; stems rusty-brown, very sparingly pubescent. *Leaves* ovate-acute, base rounded, firmly sub-coriaceous, very sparsely hirsute with scattered rusty hairs beneath, glabrous above; length 2 to 3 in., width 1 to 2 in.; petiole ·5 to 1 in., minutely sparingly rusty-pubescent. *Flowers* in open 3–8-flowered corymbose cymes 1 to 1·5 in. across; peduncles minutely sparingly rusty-pubescent, 2 to 5 in. long; bracts caducous. *Sepals* orbicular, minutely adpressed-grey-tomentose externally, in flower ·25 in., in fruit ·3 in. across, the inner larger than the outer. *Corolla* 1·5 in. long, infundibuliform-campanulate, pink, densely adpressed-fulvous-tomentose on tube and bands of limb externally. *Berry* sub-spherical to ellipsoid, ·5 in. wide, ·5 to ·75 in. long, the base closely embraced by the sepals.

PERAK: Canfield's Hill, 4,000 feet, *Scortechini* 381! Birch's Hill, *Ridley* 10681! Maxwell's Hill, *Ridley* 5559!

As in the case of *L. rubicunda*, one or two bracts remain on the specimens; they are small, orbicular, ·2 in. across, but it does not follow that the fallen bracts were so small. The corollas on Scortechini's specimens, on which the original description was based, are about ·6 in. long, but subsequent material communicated by Mr. Ridley (*Ridley* 5559) shows that the flowers originally described were not fully expanded. Another of Mr. Ridley's specimens (10681) proves that the berry is not always sub-spherical. The species is obviously closely allied to *L. rubicunda*, but besides the very different degree of tomentum, *L. Scortechini* differs from *L. rubicunda* in having the inner sepals distinctly larger, instead of smaller, than the outer.

9. LETTSOMIA RUBICUNDA, Clarke in Hook. f. Flor. Brit. Ind. IV. 195. An extensive climber; stems fulvous-tomentose. *Leaves* elliptic, shortly abruptly acuminate or acute, base rounded, sub-coriaceous, densely tawny-tomentose beneath, glabrous above; length 5 to 7 in., width 2 to 4 in.; petiole tawny-tomentose, 1 to 2 in. long. *Flowers* in open many-flowered corymbose cymes, 2 to 4 in. across; peduncles tawny-tomentose, 3·5 to 7 in. long; bracts caducous. *Sepals* orbicular, obtuse, softly tawny-velvety, in flower ·2 in., in fruit ·3 in. across, the inner rather smaller. *Corolla* ·75 in. long, infundibuliform-campanulate, pink, densely tawny-tomentose externally. *Berry* ellipsoid, obtuse,

smooth, dry, ·75 in. long, ·3 to ·5 in. wide, the base closely embraced by the sepals. *Convolvulus rubicundus*, Wall. Cat. 1409. *Argyreia rubicunda*, Choisy Convolv. Or. 44, and in DC. Prod. IX. 333.

MALACCA: *Griffith! Maingay.*—DISTRIB. Burma.

The above description is taken from Griffith's Malacca plant; the writer has seen no other specimens. One or two bracts remain; they are small, ·2 in. across, and orbicular, but it does not follow that the fallen bracts were so small. There is no perfect corolla on the specimens at Calcutta; the length of the tube given above is derived from Mr. C. B. Clarke's description.

10. LETTSOMIA KUNSTLERI, Prain Journ. As. Soc. Beng. LXIII. 2, 100. A slender climber, 50 to 80 feet long, young branches densely hirsute. *Leaves* elliptic-acuminate, glabrous and shining above, sparingly strigose-hirsute beneath, especially on the nerves, occasionally the midrib above sparsely hairy; length 3·5 to 4·5 in., width 2 to 2·5 in.; petioles densely hirsute, 1 to 1·5 in. long. *Flowers* in lax axillary 12–20-flowered cymes, 2 to 3 in. across; peduncles 5 to 8 in. long, densely hirsute; bracts hirsute, 3 in. wide; pedicels hirsute, slender, ·5 to ·75 in. long. *Sepals* orbicular, sub-equal, the three outer pubescent, the others at length almost glabrous, ·15 in. long. *Corolla* white externally, bright pink or red within, externally hirsute, tubular-campanulate, ·5 in. long. *Berry* ovoid, ·5 in. long, ·3 in. wide, deep glossy red.

PERAK: Larut; Kota, *Wray* 2856! Ulu Salama, *Scortechini!* Goping, Chanderiang, &c., *King's Collector*, 732! 2307! 2726! 5672! Campon Road, *Ridley* 9704! SELANGOR: Batu Caves, *Ridley* 8220!—DISTRIB. Sumatra.

Order LXXXII. SOLANACEÆ.

[By D. PRAIN.]

Herbs or shrubs, sometimes becoming small soft-wooded trees. *Leaves* alternate or at times in unequal pairs, rarely clustered, never truly opposite, entire, lobed or pinnate; stipules 0. *Inflorescence* of terminal or oftener lateral axillary or extra-axillary cymes, or of solitary or clustered pedicels, without bracts or bracteoles. *Flowers* regular, hermaphrodite. *Calyx* inferior, gamosepalous, lobes or teeth usually 5, rare 4 or 6 to 10; usually persistent, sometimes enlarged in fruit. *Corolla* gamosepalous 5-lobed or rarely (*Datura*) 10-lobed or with limb sub-entire; narrow-campanulate to rotate. *Stamens* 5, epipetalous; anthers oblong or narrow-ovate; cells parallel, dehiscing by apical pores or longitudinally. *Ovary* 2-celled or imperfectly

1-celled by abortion, or 4-celled by subsequent development of accessory dissepiments; style linear; stigma capitate or shortly lobed; ovules indefinite, on peltate intruded placentas. *Fruit* indehiscent, berry-like or capsular and opening by valvular or circumscissile dehiscence; usually 2-celled, rarely 4-celled, many-seeded. *Seeds* compressed, disc-like or sub-reniform with embryo peripheric; occasionally (*Nicotiana*) hardly compressed and with embryo straight.—DISTRIB. Species about 1,300, throughout tropical and sub-tropical countries.

- Fruits berry-like, 2-celled, indehiscent; seeds compressed and embedded in pulp:—
  - Anthers opening by 2 small pores at the tips; fruits globular (in *S. Melongena* sometimes elongated) .. .. .. 1. SOLANUM.
  - Anthers dehiscing throughout longitudinally:—
    - Calyx in fruit small, fruits usually elongated .. .. 2. CAPSICUM.
    - Calyx in fruit enlarging and enveloping the globose berry .. 3. PHYSALIS.
- Fruits capsular:—
  - Capsules 4-celled and 4-valved, or sometimes hardly dehiscing; seeds compressed; flowers solitary .. .. .. 4. DATURA.
  - Capsules 2-celled, dehiscing freely; seeds hardly compressed; flowers in panicles .. .. 5. NICOTIANA.

1. SOLANUM, Linn.

Armed or unarmed herbs, shrubs, or small trees. *Leaves* alternate or sub-opposed in unequal pairs, entire, lobed or pinnatifid. *Cymes* dichotomous or racemose, lateral or terminal. *Calyx* usually 5-lobed, rarely 10-lobed or sub-entire, sometimes enlarging in fruit. *Corolla-tube* short, rotate or very shortly campanulate; limb 5-lobed, plicate in bud. *Stamens* 5, with short filaments, adnate to throat of corolla; anthers oblong, narrowed upwards so that the two cells form a cone opening at the tip by terminal pores. *Ovary* 2-celled (in cultivated forms sometimes 3–4-celled); style columnar, stigma small. *Fruit* berry-like but with calyx at base, rarely overtopping it, globose or (rarely) elongated. *Seeds* very numerous, disk-like; embryo peripheric.—DISTRIB. Species 750, mostly tropical American, but spread throughout all tropical and sub-tropical regions.

- Unarmed herbs or shrubs:—
  - Flowers in extra-axillary peduncled cymes or racemes:—
    - Leaves glabrous or sparingly pubescent; cymes sub-umbellate; calyx-teeth obtuse, 5; corolla and ovary glabrous; berry red or black, rarely yellow .. .. .. 1. *S. nigrum.*
    - Leaves densely stellately woolly; cymes corymbose; calyx-teeth triangular, 5; corolla and ovary hairy; berry yellow 2. *S. verbascifolium.*
  - Flowers axillary, pedicels fascicled or solitary; corolla glabrous:—

Calyx with a sub-entire margin; flowers white; leaves glabrous; epiphytic .. .. 3. *S. parasiticum.*
Calyx with a distinctly 10-toothed margin; terrestrial:—
Leaves glabrous; calyx with 5 long teeth and 5 very short intermediate toothlets; corolla-lobes purplish; berry dark blue .. .. 4. *S. Blumei.*
Leaves usually puberulous to pubescent, rarely almost glabrous; calyx with 10 long teeth; corolla white; berry yellow .. .. 5. *S. biflorum.*
Armed herbs with prickly stems and usually prickly leaves; corolla pubescent externally:—
Densely stellate-tomentose throughout:—
Calyx not overtopping the berry; erect herbs or shrubs:—
Flowers white:—
Leaves very prickly especially on the nerves beneath; ovary hirsute; fruit hispid with acicular hairs .. 6. *S. ferox.*
Leaves with very few prickles; ovary and fruit glabrous .. .. 7. *S. torvum.*
Flowers blue:—
Racemes many-flowered; berry small, yellow, globose 8. *S. indicum.*
Racemes few-flowered; berry large, purple, rarely white or yellow, often in cultivation ellipsoid or elongate .. 9. *S. Melongena.*
Calyx overtopping the berry; a spreading shrub .. 10. *S. sarmentosum.*
Thinly beset with minute hairs; berry large, smooth; calyx very prickly .. .. 11. S. *aculeatissimum.*

1. Solanum nigrum, Linn. Sp. Pl. 186. A herb or undershrub, 1 to 3 feet high; all parts sparingly pubescent or glabrous. *Leaves* petioled, membranous, ovate or oblong, narrowed towards apex and base, sinuate-toothed or -lobed; 3 to 4 in. long, 2 in. across; green on both surfaces; petioles ·75 in. long. *Flowers* small, sub-umbellately clustered on stoutish extra-axillary peduncles ·35 to ·75 in. long; pedicels 5 to 8 together, slender, ·35 in. long. *Calyx* sparsely puberulous, 5-toothed; teeth small, ovate-oblong, ·05 in. long, in fruit hardly noticeable. *Corolla* white, rarely purplish, externally glabrous, ·5 in. wide, rotate, 5-lobed. *Ovary* glabrous; style hairy at base. *Fruit* red or black, rarely yellow, globose, ·25 in. across, supported by the saucer-shaped calyx. *Seeds* ·05 in. in diam., almost smooth. Bl. Bijdr. 694; Dun. in DC. Prod. XIII. 150; Miq. Flor. Ind. Bat. II. 636; Kurz For. Flor. Burm. II. 224; Clarke in Hook. f. Fl. Br. Ind. IV. 229. *S. rubrum*, Roxb. Flor. Ind. I. 565. *S. triangulare*, Lamk Ill. II. 18. *S. uliginosum*, Bl. Bijdr. 695. *S. Rumphii*, Dun. in DC. Prod. XIII. 57. *S. rhinocerotis*, Bl. Bijdr. 695.

Singapore: *Ridley* 8084! Perak: Kota Bahru, *King's Collector* 566! Andamans: *King's Collectors!* Nicobars: *Kurz!*—Distrib. Tropics generally.

2. Solanum verbascifolium, Linn. Sp. Pl. 184. An erect unarmed shrub, 8 to 20 feet high; all parts thickly stellate-tomentose, the

tomentum often scurfy. *Leaves* petioled, thickly herbaceous, ovate-lanceolate to lanceolate, acute; base usually truncate or rounded, rarely cuneate; 4 to 7 in. long, 3 in. across; green above, white to yellowish-brown beneath from the scurfy tomentum; petioles ·5 to 1·5 in. long. *Flowers* small, on thick tomentose pedicels, densely clustered in a small tomentose corymb-like cyme on an erect sub-terminal stout peduncle 1 to 3 in. long. *Calyx* densely tomentose, 5-toothed; teeth triangular, acute, ·1 in. long in flower. ·3 in. long in fruit; tube short. *Corolla* white, externally stellate-tomentose, ·6 in. across, rotate, 5-lobed; lobes short, ovate-oblong. *Ovary* hairy; style glabrous. *Fruit* yellow, globose, ·4 in. wide, the lower portion embraced by the calyx-lobes. *Seeds* ·12 in. in diam., minutely dotted. Dun. in DC. Prod. XIII. 114; Lour. Flor. Cochin-Chin. 128; Wall. Cat. 2616; Kurz For. Flor. II. 225; Clarke in Hook. f. Flor. Brit. Ind. IV. 230; Miq. Flor. Ind. Bat. II. 640. *S. pubescens*, Bl. Bijdr. 698; Roxb. Flor. Ind. ed. Carey & Wall. II. 244 (*not of* Willd.).

SELANGOR: Kwala Lampar, *Goodenough!* PERAK: *King's Collector* 2069! 7177! *Wray* 2357! PENANG: *Deschamps!* KEDAH: *King's Collector* 1704! NICOBARS: Kamorta, *Jelinek!* Teressa, *King's Collectors!*—DISTRIB. Tropics of both hemispheres.

3. **SOLANUM PARASITICUM**, Bl. Bijdr. 697. An erect almost glabrous epiphytic shrub, 2 to 4 feet high. *Leaves* short-petioled, rather firmly membranous, lanceolate-acuminate, narrowed towards apex and base, entire; 6 to 8 in. long, 1·5 to 2 in. wide; green on both surfaces, minutely setulose above when young, glabrous beneath; petiole ·25 to ·35 in. long. *Flowers* small, clustered in an axillary fascicle of 2 to 7 together or sometimes solitary, on slender somewhat rigid glabrous pedicels ·6 to ·8 in. long. *Calyx* glabrous, small, the margin in flower sinuate representing either 5 or 10 teeth at most only ·1 in. long; in fruit slightly enlarged, saucer-shaped, the margin quite entire. *Corolla* white, glabrous externally, 5-lobed, rotate; ·25 in. across. *Ovary* and style glabrous. *Fruit* yellow, globose, ·25 in. in diam., resting on the saucer-shaped calyx. *Seeds* ·06 in. in diam., smooth. Nees Trans. Linn. Soc. XVII. 45; Miq. Flor. Ind. Bat. II. 641.

PERAK: Larut, on trees, rather plentiful, *Wray! Scortechini! King's Collector!*—DISTRIB. Sumatra, Java.

Near *S. subtruncatum* but always epiphytic, and with an even more markedly truncate calyx-limb than in that species.

4. **SOLANUM BLUMEI** Nees ex Bl. in Bijdr. 696. An erect quite glabrous shrub, 3 to 4 feet high, with spreading branches. *Leaves* towards top in pairs from one node, usually one smaller, elliptic-acuminate at both ends, bases unequal; 4 to 6 in. long, 2 to 3 in. wide;

rather firmly membranous; lateral nerves 6 to 7 pairs; petiole ·3 in. long. *Flowers* in clusters of 2 to 9, rarely solitary, axillary; pedicels slender, in flower deflexed, in fruit spreading, ·75 in. long, thickened upwards. *Calyx* glabrous, limb sub-truncate with 5 subulate, and 5 intervening minute teeth, the longer series ·2 to ·25 in. long. *Corolla* with white tube and 5 purplish narrow-ovate lobes, ·3 in. across. *Ovary* and style glabrous. *Fruit* globose, dark blue, ·25 in. in diam., resting on the saucer-shaped calyx with persisting teeth. *Seeds* ·09 in. in diam., almost smooth. Nees Trans. Linn. Soc. XVII. 45; Dun. in DC. Prod. XIII. 180; Miq. Flor. Ind. Bat. II. 642.

SELANGOR: *Ridley!* PERAK: Larut, *King's Collector! Wray! Curtis! Ridley! Scortechini!* Gunong Panti, *Kunstler!*—DISTRIB. Sumatra, Java, Borneo.

The commonest *Solanum* of its group in our area. It has been suggested by Clarke that there is little to separate this form specifically from *S. subtruncatum*; this is true, but there seems equally little to separate it specifically from *S. biflorum*. Its glabrous condition, however, at once distinguishes it from both as, if not a species, at least a very marked form.

5. SOLANUM BIFLORUM, Lour. Flor. Cochin-Chin. 129. An erect more or less pubescent shrub, 3 to 6 feet high; the young shoots often flocculose. *Leaves* membranous, elliptic or oblong, acuminate, base narrow-cuneate, entire; 3 to 5 in. long, 1·5 to 1·75 in. wide; green on both sides, setulose-pubescent, rarely glabrescent with age; petiole ·7 in. long. *Flowers* small, clustered in axillary fascicles of 2 to 6 together, or solitary; pedicels slender, ·65 in. long. *Calyx* setulose-pubescent, the margin usually 10-toothed rarely 7–9-toothed; teeth narrowly lanceolate, setulose, ·15 in. long. *Corolla* white, externally glabrous, rotate, 5-lobed, ·25 in. across. *Ovary* and style glabrous. *Fruit* globose, yellow, ·25 in. in diam., resting on the saucer-shaped calyx with persisting teeth. *Seeds* ·1 in. in diam., almost smooth. Dun. in DC. Prod. XIII. 178; Kurz For. Flor. Burm. II. 224; Clarke in Hook f. Flor. Brit. Ind. IV. 232. *S. decemdentatum*, Roxb. Hort. Beng. 16, and Flor. Ind. I. 565; Wall. Cat. 2614; Miq. Flor. Ind. Bat. II. 643. *S. mollissimum*, Bl. Bijdr. 698. *S. decemfidum*, Nees Trans. Linn. Soc. XVII. 43. *S. Zollingeri*, Dun. in DC. Prod. XIII. 176.

MALACCA: *Griffith!* SINGAPORE: *Wallich* (*fide* Clarke).—DISTRIB. Throughout Indo-China and the Malay Archipelago.

Though so plentiful in the countries both south and north of the Malay Peninsula, this seems very rare in our area where *S. Blumei* appears to replace it.

6. SOLANUM FEROX, Linn. Sp. Pl. ed. II. 267. An erect prickly shrub, 3 to 10 feet high, with a short soft-wooded trunk 2 to 3 in. thick;

all the younger parts thickly covered with a brownish soft tomentum intermixed with many sharp compressed brownish prickles of unequal size. *Leaves* usually sub-opposite, membranous, ovate to nearly orbicular with irregular short triangular acute or blunt lobes; 5 to 9 in. long, 3 to 6 in. wide, the lobes often 1 in. deep; green above, brownish from the tawny tomentum beneath, sparingly beset on midrib and nerves with long compressed prickles; petioles ·5 to 2·5 in. long, prickly. *Flowers* large, on thickish pedicels clustered in few-flowered sub-umbellate short-peduncled racemes set close below the leaves; peduncles and pedicels densely stellate-tomentose and beset with long acicular hairs. *Calyx* shortly funnel-shaped, densely hirsute, sometimes prickly; lobes ovate-acute, ·25 in. long. *Corolla* white, densely tomentose externally, nearly 1 in. across; lobes oblong-acute. *Ovary* hairy. *Fruit* yellow, globose, 1 in. in diam., hispid with acicular hairs, much exceeding the hardly altered calyx. *Seeds* ·12 in. in diam., very slightly scrobiculate. Dun. in DC. Prod. XIII. 255; Kurz For. Fl. Burm. II. 226 (*excl.* var. β); Miq. Flor. Ind. Bat. II. 646; Clarke in Hook. f. Flor. Brit. Ind. IV. 233. *S. lasiocarpum*, Bl. Bijdr. 701; Wall. Cat. 2623; Dun. in DC. Prod. XIII. 252. *S. hirsutum*, Roxb. Hort. Beng. 17, and Fl. Ind. ed. Carey & Wall. II. 253. *S. stramonifolium*, Dun. in DC. Prod. XIII. 252 (*not of* Jacq., *nor of* Wall., *nor of* Roxb.).

PENANG: *Wallich!* PERAK: Sungah Ryah, *Kunstler* 1022! Gunong Mesah, *King's Collector* 1026! SINGAPORE: *Wallich!* ANDAMANS: Port Blair, plentiful. NICOBARS: Nancowry, *King's Collector!*—DISTRIB. India, Indo-China, S. China, Sumatra, Java.

7. SOLANUM TORVUM, Sw. Prod. Veg. Ind. Occ. 47. An erect sparingly armed shrubby perennial, 3 to 6, or at times even 8 to 12 feet high; all parts shortly and sparsely stellate-pubescent, with but few compressed sharp scattered prickles. *Leaves* usually sub-opposite, membranous, ovate, shortly acuminate, sinuate or lobed, the lobes obtuse or acute, the base truncate very unequal; 2 to 4 in. long, 1·5 to 3 in. across; rather sparingly pubescent above, more closely sometimes scurfily pubescent beneath; petioles ·5 to 1 in. long. *Flowers* medium, in lateral usually extra-axillary corymbose cymes with short pubescent peduncles; pedicels slender, ·3 to ·4 in. long, pubescent. *Calyx* sparsely pubescent, 5-toothed, ·25 in. long, without prickles, the teeth ovate-lanceolate acute, ·1 in. long, not enlarging in fruit. *Corolla* white, externally stellate-pubescent, ·5 in. across, rotate, 5-lobed, the lobes ·3 in. long, lanceolate-acuminate. *Ovary* glabrous. *Fruit* yellow, supported by the calyx which becomes glabrous in fruit, globular, ·4 in. across. *Seeds* ·2 in. in diam., compressed, minutely granular. Dun. in DC. Prod. XIII. 260; Wight Ic. t. 345; Miq. Flor. Ind. Bat. II.

648; Clarke in Hook. f. Flor. Brit. Ind. IV. 234. *S. stramonifolium*, Roxb. Flor. Ind. I. 572.

PENANG: *Wallich! Deschamps! Ridley!* MALACCA: *Griffith!* PERAK: *King's Collector* 1085! *Scortechini* 60! SINGAPORE: *Schomburgk! Hullett! Kunstler* 99! *Ridley!* ANDAMANS: very common.—DISTRIB. Malayan Archipelago, Indo-China, Philippines, China, India, Tropical America.

This is often exceedingly like the next species, *S. indicum*, but is easily distinguished by its white flowers and its considerably larger fruits.

8. SOLANUM INDICUM, Linn. Sp. Pl. 187 *partly;* Nees in Trans. Linn. Soc. XVII. 55. An erect, armed, branching shrub, 4 to 8 feet high; all young parts thickly covered with a short stellate tomentum, with broad, compressed, sharp, slightly recurved prickles. *Leaves* membranous or thinly herbaceous, ovate, sinuately lobed, the lobes obtuse or acute, the base obliquely truncate; 1·5 to 3 in. long, 1 to 2 in. wide; above minutely tomentose, green; grey from the denser tomentum beneath; petioles ·5 to 1 in. long. *Flowers* medium, in lateral or spuriously terminal racemes about 2·5 to 3 in. long; pedicels ·2 to ·3 in. long, sometimes prickly and grey stellate-pubescent, as are the peduncles. *Calyx* grey stellate-pubescent, 5-toothed, ·25 in. long, prickly or not; the teeth lanceolate-acute, hardly enlarging in fruit. *Corolla* blue, externally stellate-pubescent, ·5 in across, rotate, 5-lobed, the lobes ·35 in. long. *Ovary* glabrous. *Fruit* yellow or orange, small, supported by the hardly altered calyx, globose, ·25 in. in diam. *Seeds* ·15 in. in diam., minutely dotted. Lour. Flor. Cochin-Chin. 131; Roxb. Flor. Ind. I. 570; Wall. Cat. 2626; Wight, Ic. t. 346; Dun. in DC. Prod. XIII. 309; Miq. Flor Ind. Bat. II. 651; Kurz For. Fl. Burm. II. 226; Clarke in Hook. f. Flor. Brit. Ind. IV. 234. *S. violaceum*, Jacq. Fragm. 82, t. 133, f. 1 (*not of* R. Br.). *S. cuneatum*, Moench Meth. n. 476; Poir. Suppl. III. 743. *S. canescens*, Bl. Bijdr. 701. *S. Junghuhnii*, Miq. Flor. Ind. Bat. II. 649.

PENANG: *Wallich!* SELANGOR: *King's Collector* 363! PERAK: *Wray* 3077! ANDAMANS: *Prain!*—DISTRIB. Throughout S.E. Asia.

This species often is very like *S. torvum*; it is readily distinguished by its usually, though not invariably, more numerous prickles, by its blue flowers, and its smaller fruits.

9. SOLANUM MELONGENA, Linn. Sp. Pl. 186. A stout erect, sparingly armed herb, 2 to 8 feet high; all the younger parts covered with a grey soft tomentum. *Leaves* membranous, ovate or oblong, irregularly sinuately lobed; 3 to 6 in. long, 2 to 4 in. wide; green above, stellately pubescent beneath with a few prickles on the nerves or sometimes

quite unarmed; petiole 1 in. long. *Flowers* large, on extra-axillary often paired peduncles, one peduncle with a solitary perfect flower the other with a few-flowered raceme of male flowers; peduncles stellate-tomentose, very rarely prickly. *Calyx* shortly funnel-shaped, densely pubescent; lobes oblong-acute; ·25 to ·35 in. long, enlarging slightly in fruit, usually armed. *Corolla* blue, externally pubescent, 1 to 1·25 in. across, 5-lobed, lobes oblong-acute, short. *Ovary* glabrous; style stellate-pubescent or at times glabrous. *Fruit* large, ovoid, obovoid, ellipsoid, or cylindric; usually dark purple, often with white spots or streaks, sometimes uniformly white or yellowish, always glabrous, sometimes as much as 6 in. long and always much longer than the calyx. *Seeds* ·12 in. in diam., slightly scrobiculate. Lour. Flor. Cochin-Chin. 130; Roxb. Flor. Ind. I. 566; Miq. Flor. Ind. Bat. II. 653; Clarke in Hook. f. Flor. Brit. Ind. IV. 235. *S. insanum*, Roxb. Flor. Ind. I. 568. *S. undatum*, Lamk Encyc. IV. 301; Bl. Bijdr. 700. *S. longum*, Roxb. Hort. Beng. 16, and Flor. Ind. I. 567. *S. pseudo-undatum*, Bl. Bijdr. 699. *S. ovigerum*, Bl. Bijdr. 698. *S. Trongum*, Lamk Encyc. IV. 308. *S. ferox* var. *Trongum*, Kurz For. Flor. Burm. II. 226.

In all the provinces, cultivated; occasionally also as an escape from cultivation or sub-feral (*e.g.*, at Trang, *King's Collector* 1416!)

The Egg-Plant, or Brinjal, largely cultivated in all warm countries; originally American. As an escape this species tends to become more prickly and to have 3 to 4 fruits on the peduncle, owing to the males being replaced by perfect flowers. In such cases the fruits are much smaller and often approach, or sometimes even attain a globose form.

10. SOLANUM SARMENTOSUM, Nees Trans. Linn. Soc. XVII. 58. A straggling prickly shrub with procumbent zigzag branches, 2 to 3 feet long; all parts sparsely hairy and covered with long, straight, sharp prickles. *Leaves* membranous, broadly elliptic, sub-pinnatifid, lobes obtuse, sub-glabrescent above, sparsely stellately pubescent and prickly beneath; 4 in. long, 2 in. across, the lobes ·75 in. deep; green on both surfaces; petioles ·6 in. long. *Flowers* large, with thickish pedicels on 1–2-flowered, extra-axillary peduncles about 1 in. long, sparsely stellate-pubescent. *Calyx* with very shortly funnel-shaped tube, lobes ovate-acuminate ·2 in. long, sparsely hairy and prickly, much enlarged in fruit. *Corolla* blue, externally pubescent, ·7 in. across; lobes oblong-acute. *Ovary* glabrous. *Fruit* yellow, globose, glabrous, ·5 in. across, overtopped by the enlarged caudate-acuminate, adpressed, armed calyx-lobes, ·75 in. long and ·35 in. wide. *Seeds* ·12 in. in diam., scrobiculate. Dun. in DC. Prod. XIII. 357; Clarke in Hook. f. Flor. Brit. Ind. IV. 236. *S. Melongena*, Wall. Cat. 2628 (F. only—*not of* Linn.). *S. Jacquini*, Miq. Flor. Ind. Bat. II. 651 (*not of* Willd.).

PENANG: *Wallich!* PERAK: *Scortechini!* MALACCA: *Griffith.* PAHANG: *Ridley!*—DISTRIB. Malay Archipelago.

11. SOLANUM ACULEATISSIMUM, Jacq. Col. I. 100. An armed slender undershrub, 2 to 3 feet high, with glabrous stems covered with very many long, straight, slender prickles. *Leaves* only on the upper part of the stems, membranous, ovate, lobed, sparsely hairy; 3 to 5 in. long. *Flowers* on 1–7-flowered peduncles, that are usually only 1-fruited; peduncles in fruit ·75 in. long. *Calyx* even in fruit small, under ·25 in. long, very prickly. *Fruit* globose, 1·25 in. across, smooth. *Seeds* ·2 in. in diam., extremely compressed, almost winged. Jacq. Icon. I. t. 41; Clarke in Hook. f. Flor. Brit. Ind. IV. 237. *S. aculeatissimum* var.? *denudatum*, Dun. in DC. Prod. XIII. 244.

SINGAPORE: *G. Thomson.*

This is not in Herb. Calcutta. The above meagre description is taken from the accounts of Dunal in the *Prodromus*, and of Clarke in the *Flora of British India*. The specimen to which Clarke refers is one of the "varieties" of Dunal, not the true *S. aculeatissimum* of Jacquin, and Dunal himself was not satisfied that it is to Jacquin's species of this name that the variety should be referred. As it has not again been reported, it is possible we may have here to deal with an unusual state of some casually introduced and perhaps well-known American species.

2. CAPSICUM, Linn.

Unarmed annual or perennial, glabrous or glabrescent herbs or shrubs. *Leaves* alternate, entire or repand. *Flowers* axillary, solitary or several together. *Calyx* campanulate, minutely 5-toothed, not enlarging in fruit. *Corolla-tube* short, rotate, limb 5-lobed, valvate in bud. *Stamens* 5, adnate near base of corolla; anthers oblong, not longer than filaments, dehiscing longitudinally. *Ovary* 2-celled, rarely 3-celled; style columnar, stigma small. *Fruit* resembling a berry, but with the calyx at its base; elongated or (rarely) globose. *Seeds* very numerous, disk-like; embryo peripheric.—DISTRIB. Species 2 or more, natives of America.

The number of species is doubtful, and depends on the point of view of the reviewer with regard to the many more or less distinct forms assumed by the plants under cultivation; some writers recognise as many as 80, others claim only about 20; more recent authors insist only on 2 species—a perennial (*C. frutescens*), and an annual (*C. annuum*), both very variable. Possibly, however, there is but a single very variable species, for in the tropics the forms of *C. annuum* are often not truly annual, and in temperate regions the perennial tropical forms rarely persist for more than a season.

Pedicels solitary, variously erect or reflexed; fruits erect or spreading or pendent, at least as long as, usually longer than, the pedicels; plants annual or biennial:—
  Flowers white; berries at first green, afterwards becoming red, orange or yellow:—
    Fruit not globular:—

Berries tapering, much longer than broad :—

Fruit stout, flesh thick, usually mildly pungent; calyx not enclosing base of berry .. .. .. 1. *C. annuum.*

Fruit slender, flesh thin, keenly pungent; calyx enclosing base of berry .. .. *annuum,* VAR. *acuminata.*

Berries not much if at all longer than broad, usually obtuse; calyx not enclosing base of berry :—

Berries circular in section, sub-conical, ovate or oblong, flesh thin, pungent .. .. *annuum,* VAR. *abbreviata.*

Berries swollen, irregularly angled in section, prismatic, quadrate or oblate, flesh very thick, hardly at all pungent *annuum,* VAR. *grossa.*

Fruit globular, extremely pungent .. .. .. *annuum,* VAR. *cerasiformis.*

Flowers purple; berries at first dark-purple, afterwards becoming orange-red, much longer than broad, only slightly pungent; calyx hardly enclosing base of berry .. .. .. *annuum,* VAR. *nigra.*

Pedicels 2 or more, erect; fruit always erect, red, shorter than the pedicels, pungent; plants perennial; flowers always white or yellowish-white :—

Berries elongated, tapering; base embraced by the calyx .. 2. *C. frutescens.*

Berries globose or sub-globose; base seated on the calyx .. *frutescens,* VAR. *baccata.*

1. CAPSICUM ANNUUM, Linn. Sp. Pl. 188. An erect branching or rarely simple robust herb 2 to 3 feet high, with slightly ridged branches; glabrous throughout. *Leaves* membranous, elliptic or ovate, rather long-acuminate, base long-cuneate, prolonged as a wing on upper part of petiole, margin entire; lamina 3 in. long, ·75 to 1 in. wide, rarely 1·5 in. wide, green on both surfaces; petiole ·25 to ·6 in. long. *Flowers* white or rarely (VAR. *nigra*) purple; pedicels almost always solitary, though casually there may be more than one in a leaf-axil, always drooping in flower, in fruit rigid, slightly thickened under the enlarging calyx and variously erect, or spreading or recurved and pendent, then ·75 to 1 in. long. *Calyx* glabrous, campanulate, with sinuate-dentate limb, ·2 in. across; in fruit enlarging into a shallow cup embracing the lower part of fruit, or saucer-shaped with the base of the fruit resting on it, then often ·5 in. across. *Corolla* rotate, ·4 in. across; 5-lobed. *Ovary* glabrous. *Fruit* erect, straight, very variable in shape, colour, fleshiness and pungency. Irish Miss. Bot. Gard. Rep. IX. 65.

VAR. *typica.* Fruit much longer than broad, stout, tapering to the usually narrow apex; flesh thick, mildly pungent; berry resting on the saucer-shaped fruiting calyx; colour variable.

In gardens, occasionally, usually raised from seed imported from Europe.

This variety includes the many mild chillies which do not keep true to their characters when their seed is collected in the tropics.

VAR. *acuminata*, Fingerhuth. Fruit much longer than broad, slender, rarely straight, always tapering to an acute or sub-acute apex; flesh thin, keenly pungent; berry enclosed at the base by the cupular calyx; colour red or orange, or yellow. *C. longum*, DC. Hort. Monsp. 86; Fingerhuth, Caps. 23, t. 6, 7; Dun. in DC. Prod. XIII. 424. *C. frutescens*, Roxb. Hort. Beng.. 17; Flor. Ind. I. 574; Bl. Bijdr. 704; Clarke in Hook. f. Flor. Brit. Ind. IV. 239.

Cultivated in most of the provinces.

Some of the forms of this variety seem to have been evolved since the introduction of *Capsicum annuum* to the Eastern Hemisphere.

VAR. *abbreviata*, Fingerhuth. Fruit conoid, ovate or oblong, not much longer than broad, apex usually blunt; flesh thin, pungent; berry resting on the saucer-shaped fruiting calyx; colour variable. *C. annuum*, Roxb. Flor. Ind. I. 573. *C. frutescens*, Dun. in DC. Prod. I. 413. *Capo Molago*, Rheede Hort. Malab. II. 109, t. 56.

Occasionally cultivated.

VAR. *grossa*, Sendt. Fruit swollen, somewhat angular, prismatic or quadrate or oblate, obtuse, hardly longer than broad; flesh thick, hardly pungent; berry resting on the saucer-shaped fruiting calyx; colour red. *C. grossum*, Linn. Mant. 47; Willd. Sp. Pl. I. 1051; Roxb. Hort. Beng. 17; Flor. Ind. I. 574; Fingerhuth, Caps. 21; Dun. in DC. Prod. XIII. 422; Miq. Flor. Ind. Bat. II. 659; Clarke in Hook. f. Flor. Brit. Ind. IV. 239.

Occasionally cultivated.

VAR. *cerasiformis*, Mill. Fruit globular, red, flesh thin, very pungent. *C. cerasiforme*, Roxb. Flor. Ind. I. 574. *C. grossum*, VAR. *cerasiformis*, Clarke in Hook. f. Flor. Brit. Ind. IV. 239.

Sometimes grown in gardens by European residents.

VAR. *nigra*. Fruit much longer than broad; flesh thin, only slightly pungent; calyx hardly enclosing base of fruit; berry at first dark purple, at length becoming orange-red. *C. purpureum*, Roxb. Flor. Ind. IV. 239.

Occasionally cultivated.

2. CAPSICUM FRUTESCENS, Linn. Sp. Pl. 189. An erect, much-branching undershrub, 2 to 4 feet high, branches angled, the smaller ones puberulous but soon, like the leaves, becoming quite glabrous. *Leaves* petioled, membranous, ovate-acute, the base short-cuneate, truncate or rarely sub-cordate, the margins entire; lamina usually 2·5 to 4 in. long, 1·5 in. wide, green on both surfaces; petiole ·5 to ·75 in. long. *Flowers* small, white or yellowish-white; pedicels usually 2 to 3, sometimes 4 or more together in leaf-axils, never all of the same age, drooping in

flower and erect, thickened, rigid and somewhat elongated in fruit, 1 to 1·25 in. long. *Calyx* glabrous; limb truncate with 5 shortly projecting, spreading teeth ·12 in. in diam. *Corolla* ·2 in. in diam., rotate, 5-toothed. *Ovary* glabrous. *Fruit* erect, narrow to globose, bright red, ·2 to ·25 in. in diam. Irish Miss. Bot. Gard. Rep. IX. 97.

VAR. *typica.* Fruits ovate or sub-cylindric, acute, ·75 in. long, ·2 in. in diam. *C. frutescens*, Wall. Cat. 2642 B.C. *C. minimum*, Roxb. Hort. Beng. 17, Flor. Ind. ed. Carey & Wall. II. 261, and ed. propr. I. 574; Wall. Cat. 2641; Blanco, Flor. Filip. 133; Dun. in DC. Prod. XIII. 415; Miq. Flor. Ind. Bat. II. 659; Clarke in Hook. f. Flor. Brit. Ind. IV. 239. *C. fastigiatum*, Bl. Bijdr. 705; Nees Trans. Linn. Soc. XVII. 64; Dun. in DC. Prod. XIII. 416; Wight Ic. t. 1617; Miq. Flor. Ind. Bat. II. 659; Bentl. & Trim. Med. Pl. t. 188.

In all the provinces, cultivated and as an escape.

VAR. *baccata*, Irish l.c. 99. Fruit elliptic-obtuse or globose, ·25 to ·3 in. long, ·25 in. in diam. *Capsicum baccatum*, Linn. Ment. 46; Ham. in Wall. Cat. 2644. *C. angustifolium*, Dun. in DC. Prod. XIII. 420.

NICOBARS: cultivated, *Jelinek* 137! 138!

3. PHYSALIS, Linn.

Annual or perennial herbs. *Leaves* alternate, entire sinuate or shortly lobed. *Pedicels* axillary, solitary. *Calyx* campanulate, 5-partite in flower, the tube much enlarged and inflated in fruit, loosely enclosing the berry; teeth small, connivent. *Corolla* campanulate, yellow. *Stamens* 5, attached near base of corolla; anthers oblong, shorter than filaments, dehiscing longitudinally. *Ovary* 2-celled; style columnar; stigma obscurely 2-lobed. *Fruit* berry-like, globose. *Seeds* few or many, disk-like; embryo peripheric.—DISTRIB. Species about 34, mostly tropical American.

PHYSALIS MINIMA, Linn. A herbaceous pubescent or glabrescent annual, erect or with procumbent straggling branches, 6 to 15 in. high. *Leaves* petioled, ovate, sinuate angular or hardly lobed; 2 in. long, ·75 in. wide, green on both surfaces; petioles 1 in. *Flowers* small, axillary, solitary; pedicels ·25 to ·5 in. *Calyx* hirsute or glabrescent; in flower ·1 to ·2 in., with lanceolate lobes as long as tube, in fruit ·75 to 1 in., ovoid or sub-globose, 5–10-ribbed, the teeth subconnivent and little altered. *Corolla* yellow, ·25 in. across, glabrous, campanulate, 5-toothed. *Ovary* glabrous. *Fruits* yellow, globose, ·5 in. across, completely enveloped by the accrescent calyx. *Seeds* very many, ·1 in. in diam., discoid, reticulated, hardly scabrous.

VAR. *typica;* calyx not distinctly angled, all parts more or less pubescent. *P. minima*, Linn. Sp. Pl. 183; Nees in Trans. Linn. Soc.

XVII. 69; Roxb. Flor. Ind. I. 563; Dun. in DC. Prod. XIII. 445; Clarke in Hook. f. Flor. Brit. Ind. IV. 238; Miq. Flor. Ind. Bat. II. 664. *P. parviflora*, R. Br. Prod. 447. *P. divaricata*, Don Prod. 97. *P. villosa*, Roth Nov. Sp. 122. *P. Rothiana*, Roem. & Schult. Syst. IV. 677. *P. Hermanni*, Dun. in DC. Prod. XIII. 444.

PERAK: *Scortechini!* MALACCA: *Griffith!* ANDAMANS: common in waste places.—DISTRIB. A cosmopolitan tropical weed.

VAR. *indica*, Clarke Flor. Brit. Ind. IV. 238; calyx distinctly 5-angled, all parts nearly glabrous. C. *indica*, Lamk Encyc. Meth. II. 102; Nees in Trans. Linn. Soc. XVII. 70; Dun. in DC. Prod. XIII. 443; Miq. Flor. Ind. Bat. II. 662. *P. pseudoangulata*, Bl. Bijdr. 706; Miq. Flor. Ind. Bat. II. 663. *P. angulata*, Griff. Notul. IV. 96. *Nicandra indica*, Roem. & Schult. Syst. IV. 632.

PERAK: Kota Bahru, *Kunstler*, 568! Ipoh, *Curtis* 3190! PENANG: *Deschamps!* common. SELANGOR: *Ridley* 10548! NICOBARS: coasts, common.—DISTRIB. India generally.

The Cape Gooseberry, or Winter Cherry (*Physalis peruviana*), is cultivated in European gardens in the cold weather.

4. DATURA, Linn.

Suffruticose, rank-smelling, glabrous or minutely pubescent herbs. *Leaves* large, entire, sinuate or deeply toothed. *Pedicels* solitary, flowers very large, purple or white. *Calyx* long-tubular, herbaceous, apex 5-toothed; in fruit circumscissile above the base. *Corolla* narrowly tubular-funnel-shaped; throat widened, limb plaited, entire or shortly lobed. *Stamens* attached near base of tube, filaments filiform; anthers included, linear, dehiscing longitudinally. *Ovary* 2-celled, or 4-celled by the formation of spurious dissepiments; style filiform; stigma 2-lobed. *Fruit* a capsule, ellipsoid, 4-celled, spinous, more or less completely 4-valved. *Seeds* very many, compressed, rugose; embryo peripheric.—DISTRIB. Species 10, temperate and tropical.

DATURA FASTUOSA, Linn. Syst. ed. X. 932. A coarse annual, 3 to 8 feet high, all parts glabrescent or very faintly puberulous. *Leaves* petioled, membranous, ovate, entire or deeply toothed, glabrous, green; 6 to 8 in. long, 3 to 4 in. across, base unequal; petioles 1 in. *Flowers* very large, solitary, pedicels ·25 to ·5 in., erect in flower, recurved in fruit. *Calyx* tubular, 2·5 to 3 in. long, ·5 in. wide, lobes lanceolate, ·25 in. long. *Corolla* purple or white, 7 in. long, base ·5, throat 1·5, limb 3 to 5 in. in diam., shortly 5–6-toothed. *Ovary* glabrous. *Capsules* sub-globose, 4-celled, equally spinous on all sides, irregularly dehiscent near apex, supported by the persistent base of calyx; 1·25 to 1·5 in. in diam. *Seeds* ·25 in. diam.

VAR. *typica;* corolla purple. *D. fastuosa*, Linn. Syst. ed. X. 932; Roxb. Flor. Ind. I. 561; Wall. Cat. 2638; Nees in Trans. Linn. Soc. XVII. 74; Dun. in DC. Prod. XIII. 542; Miq. Flor. Ind. Bat. II. 669; Clarke in Hook. f. Flor. Brit. Ind. IV. 242. *D. Hummatu*, Bernh. in Linn. Litteraturber. (1883) 141.

VAR. *alba*, Clarke in Flor. Brit. Ind. IV. 243; corolla white or cream-coloured. *D. alba*, Nees in Trans. Linn. Soc. XVII. 73; Wight Ic. t. 852; Dun. in DC. Prod. XIII. 542; Miq. Flor. Ind. Bat. II. 667. *D. Metel*, Roxb. Flor. Ind. I. 561; Wall. Cat. 2639 (*not of* Linn.).

PERAK: Larut, *Scortechini!* Ulu Bubong, *King's Collector!* SINGAPORE: *Hullett!*—DISTRIB. Tropical Africa, S.E. Asia.

The purple-flowered variety has not been sent to Calcutta from any of the provinces. Kunstler says that the white one is "not native" in Perak.

5. NICOTIANA, Linn.

Erect, viscid-pubescent herbs, shrubs, or trees. *Leaves* entire or sinuate. *Racemes* paniculate, terminal or sub-terminal. *Calyx* tubular or ovoid, 5-fid. *Corolla* funnel-shaped; lobes 5, induplicate in bud. *Stamens* attached to lower part of corolla-tube, filaments filiform; anthers ovate, dehiscing longitudinally. *Ovary* 2-celled; style filiform; stigma shortly 2-fid. *Fruit* a capsule, 2-celled, or rarely spuriously almost 4-celled; valves separating to their middle, often again splitting. *Seeds* very many, small, scarcely compressed; embryo nearly straight.—DISTRIB. Species about 35; American, Australian, Polynesian.

NICOTIANA TABACUM, Linn. Sp. Pl. 180. A herb 2 to 3 feet high branching upwards, all parts glandular-pubescent. *Leaves* large, sessile or sub-amplexicaul, ovate-lanceolate, acute, the lower decurrent; 4 to 8 in. (the lower sometimes 12 to 15 in. long) by 2 to 3 in. across; tapering to the cuneate base. *Flowers* large, in compound corymbs with short ultimate bracteate branchlets. *Calyx* campanulate, ·5 in. long, ·3 in. wide, teeth 5, triangular-lanceolate, ·2 in. long. *Corolla* pink or pale-rose, linear-funnel-shaped, 1·75 to 2 in. long, limb 1 in. across, lobes spreading ovate, sub-acuminate. *Capsule* ovate, ·75 in. long, ·5 in. in diam., slightly exceeding calyx. *Seeds* small. Gaertn. Fruct. I. 264, t. 55; Lamk Ill. t. 113; Dun. in DC. Prod. XIII. 557; Miq. Flor. Ind. Bat. II. 670; Clarke in Hook. f. Flor. Brit. Ind. IV. 245.

In all the provinces, cultivated.

A native of America, cultivated in all warm countries. The common Tobacco.

Order LXXXIII. SCROPHULARIACEÆ.

[By D. Prain.]

Herbs or shrubs, occasionally epiphytic, sometimes semi-parasitic. *Leaves* all or only the lower opposite, rarely all alternate or whorled, occasionally all radical, sub-rosulate; stipules 0. *Flowers* hermaphrodite, usually irregular; inflorescence centripetal or composite. *Calyx* inferior, 5-, rarely 4-lobed or -partite. *Corolla* hypogynous, more or less 2-lipped or occasionally personate; upper lip entire or 2-lobed, lower 3-lobed. *Stamens* epipetalous, usually 4, didynamous or rarely sub-equal, occasionally only 2, very rarely 5; anthers 2-celled, cells distinct or apically or entirely confluent, or 1-celled by abortion, often when stamens didynamous with anthers connivent and sometimes with their apices connate in a posterior and an anterior pair. *Disk* annular, cupular, or glandular. *Ovary* superior, 2-celled; ovules usually numerous in each cell, anatropous or amphitropous; style simple; stigma capitate or dilated, simple; occasionally 2-lobed or 2-lamellate. *Fruit* usually a capsule, rarely a berry; placentas sometimes persistent on a central axis, at others attached to margins of valves. *Seeds* small with a lateral or ventral hilum; albumen fleshy, rarely absent; embryo straight or curved.—Distrib. Species 2,000 or more, in all regions.

Angelonia grandiflora, C. Morr., an American species, has become naturalised as an escape from gardens in Selangor (*Goodenough* in Herb. Ridley 10486); it has long been similarly naturalised in Tenasserim and the Irawadi Delta, and has more recently become established in the Gangetic Delta.

- Corolla with upper lip or two upper lobes outmost in bud :—
  - Stamens 4, fertile :—
    - All 4 filaments inserted within corolla-tube :—
      - Trees or epiphytes .. .. 1. Wightia.
      - Herbs :—
        - Throat of corolla plicate, forming a 2-lobed palate; anther-cells contiguous, divaricate .. .. .. 2. Mazus.
        - Throat of corolla not plicate :—
          - Anther-cells discrete, stipitate; corolla distinctly 2-lipped :—
            - Upper lobe of calyx distinctly exceeding the others; 2 or sometimes all the anthers with one cell imperfect 3. Adenosma.
            - Upper lobe of calyx hardly if at all exceeding the others; all 4 stamens with perfect anthers .. 4. Limnophila.
          - Anther-cells contiguous; lateral calyx-lobes much narrower than the other three; corolla sub-equally 5-lobed .. .. 5. Herpestis.
    - Only 2 posterior filaments inserted within corolla-tube; the anterior pair inserted on corolla-throat :—
      - Calyx with 3 to 5 distinct ridges or wings .. .. .. 6. Torenia.

Calyx without wings or ridges :—
Calyx-segments narrow .. .. .. 7. VANDELLIA.
Calyx-segments broad .. .. .. 8. ARTANEMA.
Stamens only 2 posterior fertile, inserted within corolla-tube ; anterior pair reduced to staminodes on corolla-throat :—
Calyx 4-lobed, the outer lobes very broad .. .. 9. CURANGA.
Calyx 5-lobed, the lobes all narrow .. .. .. 10. BONNAYA.
Corolla with upper lip or 2 upper lobes inmost in bud ; rarely lobes imbricate :—
Corolla-tube very short ; lobes 4, sub-equal, imbricate ; stamens 4, sub-equal .. .. 11. SCOPARIA.
Corolla-tube elongated ; lobes 5, 2-labiate :—
Calyx tubular, 5-lobed .. .. 12. STRIGA.
Calyx spathaceous, split in front .. .. .. 13. CENTRANTHERA.

1. WIGHTIA, Wall.

Large epiphytic climbers, eventually becoming trees. *Leaves* mostly or all opposite, quite entire, coriaceous. *Flowers* in usually axillary, often thyrsoid racemes ; large, rosy or purple, pubescent. *Calyx* campanulate, irregularly 3–5-lobed. *Corolla-tube* incurved, upper lip erect, 2-lobed, lower spreading, 3-fid. *Stamens* 4, didynamous, ascending, exserted ; anthers oblong, sagittate, cells parallel. *Style* long, tip incurved ; stigma simple. *Capsule* oblong-ovoid, septicidal, many-seeded, valves long, separating from the placentiferous axis, which is 2-partite or entire. *Seeds* linear, ascending, nucleus slender, testa membranous, broadly winged all round ; albumen 0 ; embryo straight. —DISTRIB. Species 3, all S.E. Asiatic.

The species of this genus exhibit the primarily epiphytic but subsequently arboreal habit characteristic of many species of *Ficus*. Though often loosely spoken of as parasites, and though, as a matter of fact, they frequently strangle the trees on which they become established, epiphytes of this class are not parasites in the physiological sense.

WIGHTIA BORNEENSIS, Hook. f. in Ic. Plant. XV. 35, t. 1444 (1883). A tree, 20 feet in height and upwards, commencing life as an epiphyte and flowering most freely in that condition. *Leaves* opposite, thinly coriaceous, glabrous as are the lenticellate branchlets, drying brown, margin entire, outline elliptic, apex obtusely acuminate, base cuneate, narrowed to the petiole, main-nerves 2–3-jugate ; length 3 to 4 in., breadth 1·25 to 1·75 in. ; petiole ·75 in. long. *Flowers* opposite or whorled on the rachis of axillary or terminal racemes, pedicels slender, rigid, spreading, ·5 in. long ; rachis stout, glabrous, erect, 6–10-flowered, 3 to 6 in. long. *Calyx* campanulate, margin entire, ·4 in. across. *Corolla* trumpet-shaped, incurved, purple, densely beset with a fine stellate tomentum, 2 in. long, lobes rounded, throat slightly enlarged. *Stamens* inserted near base of corolla ; filaments slender, far-exserted ;

anthers sagittate. *Ovary* glabrous; style filiform; stigma simple. *Fruit* not seen.

PERAK: Larut Hill at 3,000 feet, *Derry* (Herb. Curtis, n. 3710)!—DISTRIB. Borneo.

The solitary Perak specimen agrees well with a specimen from Borneo in Herb. Kew; as our Perak example is destitute of leaves the description of these is based on a second Bornean example of the plant. The species is most readily distinguished from the other two known species by its entire calyx-limb.

2. MAZUS, Lour.

Small herbs, often surculose. *Leaves* rosulate or opposite below, opposite or alternate above. *Flowers* in terminal, sub-secund racemes; bracts minute or 0; bracteoles 0. *Calyx* campanulate, 5-fid; lobes large, leafy. *Corolla* 2-lipped; tube short, upper lip erect, ovate, 2-fid; lower longer, spreading, 3-fid; throat with a 2-lobed palate. *Stamens* 4, didynamous; anther-cells contiguous, divaricate. *Ovary* 2-celled; style short; stigma 2-lamellate; ovules numerous. *Capsule* globose or compressed, loculicidal, 2-valved, included. *Seeds* many, ovoid, very minute.—DISTRIB. Species about 5, Asiatic and Australian.

MAZUS RUGOSUS, Lour. Flor. Cochin-Chin. 385. A small annual glabrous or sparingly hirsute herb. *Leaves* many, radical, obovate-spathulate, irregularly coarsely crenate, narrowed to a short petiole, ·75 to 3 in. long. *Scapes* numerous from the root, 2 to 10 in. long, leafless or with a few alternate spathulate leaves, with terminal racemes 1 to 6 in. long, the pedicels slender, ·25 to ·5 in. long, usually without bracteoles. *Calyx* campanulate, ·25 in. long, lobes ovate-lanceolate, acute, half as long as tube, spreading in fruit. *Corolla* pale blue, ·3 in. long. *Capsule* ·2 in. long, included in the calyx; calyx-mouth in front ·3 to ·5 in. across. *Seeds* very minute; testa pale straw-coloured. Benth. in DC. Prod. X. 375; Boiss. Fl. Orient. IV. 424; Miq. Flor. Ind. Bat. II. 677; Hook. f. Flor. Brit. Ind. IV. 259. *M. bicolor*, Benth. in Wall. Cat. 3913. *M. vandellioides*, Hance in Walp. Ann. III. 193. *Lindernia japonica*, Thunb. Flor. Japon. 253. *Hornemannia bicolor*, Willd. Enum. Hort. Berol. 654; Reichb. Icon. Exot. 25, t. 37. *Columnea tomentosa*, Roxb. Flor. Ind. III. 98. *Stemodia tomentosa*, G. Don Gen. Syst. Gard. IV. 842. *Tittmannia obovata*, Bunge Enum. Pl. Chin. 279. *Vandellia obovata*, Walp. Act. Acad. Leopold. XIX., Suppl. I. 394. *Gratiola goodeniæfolia*, Hornem. Hort. Hafn.

SINGAPORE: a garden weed, *Ridley*!—DISTRIB. E. and S.E. Asia generally.

3. ADENOSMA, R. Br.

Annual, villous or glandular aromatic herbs. *Leaves* opposite, rugose, crenulate. *Flowers* axillary or in leafy spikes, racemes or heads; bracteoles conspicuous or absent. *Calyx* deeply 5-lobed; lobes imbricate, the upper the largest; sometimes in fruit all enlarged. *Corolla* 2-lipped; upper lip erect, entire or notched, outmost in bud; lower 3-lobed, spreading; throat not plicate; tube cylindric. *Stamens* 4, didynamous, included; anther-cells discrete, stipitate, one cell of each anterior stamen or of all four stamens empty. *Ovary* 2-celled; ovules in each cell numerous; style filiform below, winged upwards under the entire or 2-lamellate stigma. *Fruit* an ovoid, ellipsoid, or lanceolate 2-grooved and 4-valved capsule, opening both loculicidally and septicidally. *Seeds* many, minute, reticulate.—DISTRIB. Species about 10, in S.E. Asia and Australia.

Flowers axillary; outer fruiting sepals enlarged:—
  Leaves ovate-obtuse, crenate-serrate .. .. .. 1. *A. ovatum.*
  Leaves ovate-acute, serrate .. .. 2. *A. inopinatum.*
Flowers in terminal heads, spikes or racemes; sepals little altered:—
  Bracts linear, hardly exceeding the calyx:—
    Spikes short, dense, cylindric or capitate .. .. 3. *A. capitatum.*
    Spikes long, slender .. .. 4. *A. cæruleum.*
  Bracts leafy, elliptic, acute, longer than calyx .. .. 5. *A. hirsutum.*

1. ADENOSMA OVATUM, Benth. in Hook. fil. Flor. Brit. Ind. IV. 263. A puberulous or glabrate herb, branched from the base; branches rooting below, prostrate or ascending, 6 to 18 in. long. *Leaves* ovate-obtuse, crenate-serrate, base wide-cuneate, rounded or truncate; blade ·75 in. long, ·5 in. wide; petiole ·3 in. *Flowers* axillary, sessile; bracts lanceolate, shorter than the calyx. *Calyx* of 5 almost free sepals; in flower herbaceous, sub-equal; in fruit membranous, reticulate, pubescent, the 3 outer enlarged, ·35 in. wide, ovate-cordate, the 2 inner unaltered, narrow lanceolate, all ·25 in. long. *Corolla* blue. *Capsule* lanceolate, about as long as the sepals but hidden by the enlarged outer ones. *Herpestis ovata*, Benth. Scroph. Ind. 30; Wall. Cat. 3896. *H. javanica*, Bl. Bijdr. 748. *Pterostigma ovatum*, Benth. in DC. Prod. X. 380; Miq. Flor. Ind. Bat. II. 678.

PERAK: Gunong Tundul, *Ridley* 9444! PENANG: Waterfall, *Curtis!* MALACCA: *Griffith!* SINGAPORE: Bukit Timah, *Ridley* 6894! "a garden weed," *Ridley* 8910!—DISTRIB. Indo-China, Malay Archipelago.

2. ADENOSMA INOPINATUM, Prain Journ. As. Soc. Beng. LXXII. 2, 16. A pubescent herb, branched from the base; branches rooting below, ascending, 6 to 18 in. long. *Leaves* ovate-acute, serrate, base cuneate; blade 1 to 1·5 in. long, ·75 to 1 in. wide; petiole ·3 in. *Flowers* axillary, sessile; bracts lanceolate, shorter than calyx. *Calyx*

of 5 almost free sepals; in flower herbaceous, sub-equal; in fruit membranous, reticulate, the 3 outer enlarged, ·25 in. wide, ovate-lanceolate with truncate bases, the 2 inner unaltered, narrow lanceolate, all ·25 in. long. *Corolla* blue. *Capsule* lanceolate, about as long as the sepals but hidden by the enlarged outer ones.

MALACCA: *Griffith!* SINGAPORE: *Anderson! King's Collector!*

Very nearly allied to *A. ovatum*, Benth., and *A. subrepens*, Benth. It differs from both by its acute leaves, but except in this respect and as regards its distribution it is hardly separable from *A. subrepens* of Ceylon. From *A. ovatum* of Tenasserim, with which it has been confused, it further differs in its larger size, coarser habit of growth, and much narrower outer sepals. It has also been confused with *A. cœruleum*, from which it differs by its flowers being all axillary and by its enlarged fruiting sepals.

3. ADENOSMA CAPITATUM, Benth. in Hook. f. Flor. Brit. Ind. IV. 264. A stout, erect, glandular-villous herb, 1 to 2 feet high. *Leaves* ovate or oblong, sub-acute, serrate, often reflexed; base cuneate; blade 1 to 2 in. long, ·5 to ·75 in. wide; petiole very short. *Flowers* in dense cylindric or globose terminal or axillary heads, with basal involucres of floral leaves; peduncles 1 in. or less, sometimes in the lower clusters subobsolete and the flowers in axillary whorls; heads usually ·5 in. across, sometimes longer up to 4 in. long; bracts linear, hardly exceeding the sepals. *Calyx* of 5 almost free sepals, villous with long hairs, ·25 in. long, the uppermost ovate-lanceolate, broader than the other lanceolate 4. *Corolla* blue. *Capsule* ovoid, ·2 in. long. *Stemodia capitata*, Benth. in Bot. Reg. under t. 1470; Wall. Cat. 3926. *Pterostigma spicatum*, Benth. Scroph. Ind. 21. *P. capitatum*, Benth. Scroph. Ind. 31, and in DC. Prod. X. 380. *Erinus bilabiatus*, Roxb. Fl. Ind. III. 92.

PROV. WELLESLEY: *King! King's Collector.* PENANG: *Wallich; Deschamps! Curtis!* SINGAPORE: *King! Ridley!* MALACCA: *Cuming!* Ayer Keroh, *Ridley! Griffith; Wallich.* NEGRI SEMBILAN: Kwala Pedas, *Ridley!* PAHANG: *Ridley!*—DISTRIB. Throughout S.E. Asia.

4. ADENOSMA CŒRULEUM, R. Br. Prod. 443. An erect herb, 1 to 2 feet high, viscidly pubescent. *Leaves* ovate-acute, crenate, base rounded or cordate; blade 1·5 to 2·5 in. long, 1 to 2 in. wide; petiole ·5 to 1 in. long. *Flowers* in long slender strict spikes; bracts lanceolate, about as long as calyx. *Calyx* of 5 almost free sepals, the upper lanceolate the rest linear, not very greatly altered in fruit. *Corolla* blue. *Capsule* lanceolate, rather longer than the sepals. Benth. Flor. Austral. IV. 484; Hook. f. Flor. Brit. Ind. IV. 263. *Pterostigma villosum*, Benth. Scroph. Ind. 21, and in DC. Prod. X. 380, *partly*; Miq Flor. Ind. Bat. II. 678. *P. strictum*, Griff. Not. IV. 96; Ic. Pl. Asiat. t. 417, f. 3. *Stemodia cærulea*, Benth. in DC. Prod. X. 381. *Herpestis lanuginosa*, Bl. Bijdr. 747.

SELANGOR: *Ridley!* PERAK: *Scortechini! Wray!* MALACCA: *Griffith! Cuming! Maingay; Hervey!* SINGAPORE: *Cuming! Wallich.*—DISTRIB. Indo-China, Malaya, Australia.

Scortechini notes on this, "aromatic; most likely introduced." It appears, however, to be native.

5. ADENOSMA HIRSUTUM, Kurz Journ. As. Soc. Beng. XLV. 2. 143. A stout, erect, villous herb, 2 to 3 feet high. *Leaves* ovate or elliptic, sub-acute, serrate, base cuneate; blade 1 to 2 in. long, ·5 to ·75 in. wide; petiole very short or 0. *Flowers* in dense cylindric or oblong heads, often ternate, usually peduncled, with closely imbricate hirsute leafy bracts; peduncles sometimes 1·5 in. long; heads 1 to 3 in. long, ·75 to 1 in. wide; bracts ovate-acute, serrate, ·4 to ·6 in. long. *Calyx* of 5 almost free villous linear sepals, ·25 in. long. *Corolla* blue. *Capsule* ovate, abruptly beaked, as long as calyx. *Pterostigma hirsutum*, Miq. Flor. Ind. Bat. Suppl. 562. *P. villosum*, Miq. l.c. (*not of* Benth.).

PROVINCE WELLESLEY: *Curtis* 2238! *Ridley* 6977! NICOBARS: Kamorta, *Kurz!*—DISTRIB. Sumatra (*Teysmann* 1157), Bangka (*Teysmann* 3429), Borneo (*Motley*, n. 215).

A coarser plant than *A. capitatum*, with leafy bracts throughout the spikes.

4. LIMNOPHILA, R. Br.

Herbs of marshes and pools, glabrous or pubescent, aromatic. *Leaves* with transparent dots, opposite or whorled, toothed or cut, when submerged frequently laciniate-multifid. *Flowers* solitary axillary, sessile or pedicelled, or passing into terminal spikes or racemes; bracts leafy; bracteoles small or obsolete. *Calyx* 5-partite; lobes narrow, imbricate, all equal or the upper largest. *Corolla* 2-labiate; upper lip outmost, sub-erect, entire or 2-fid; lower spreading, 3-lobed; throat not plicate; tube cylindric. *Stamens* 4, didynamous, included; anther-cells all perfect, usually discrete, stipitate, occasionally contiguous. *Ovary* 2-celled; ovules in each cell numerous; style slender, with deflexed tip and 2-lamellate stigma. *Fruit* an ovoid or oblong capsule, with both septicidal and loculicidal dehiscence, the placentiferous septum separating from the valves. *Seeds* many, minute, angular and truncate, reticulate.—DISTRIB. Species about 25, in the tropics of the Eastern Hemisphere and Australia.

Leaves never pinnatifid above, very rarely so even on lower portion of stem:—
  Flowers sessile:—
    Leaves at least 1 in. long:—
      Leaves petioled, 2 to 3 in. long, pubescent or glabrous .. 1. *L. Roxburghii.*

Leaves sessile, 1 to 2 in. long, softly pubescent .. .. 2. *L. balsamea.*
Leaves glabrous, never exceeding ·5 in. long .. .. 3. *L. micrantha.*
Flowers pedicelled :—
Leaves hirsute :—
Leaves usually opposite, rarely 3-nate, never more than ·75 in. long; flowers always axillary, solitary .. 4. *L. villosa.*
Leaves usually 3–4-nately whorled, rarely opposite, never less than 1·5 in. long; flowers usually cymose or paniculate, rarely axillary, solitary .. .. .. 5. *L. hirsuta.*
Leaves glabrous :—
Leaves cuneate at base, always opposite; flowers axillary, solitary :—
Stems creeping; branches many, divaricate; pedicels in fruit erect .. .. 6. *L. pygmæa.*
Stems erect, usually simple; pedicels in fruit recurved .. 7. *L. erecta.*
Leaves half-amplexicaul at base, often 3–4-nately whorled, flowers usually in many-flowered racemes, rarely axillary, solitary .. .. 8. *L. gratissima.*
Leaves mostly or all lobulate or pinnatisect, or capillary multifid :—
Flowers sessile or shortly pedicelled; uppermost leaves entire:—
Flowers all solitary .. .. 9. *L. sessiliflora.*
Flowers passing into a terminal spike .. .. 10. *L. heterophylla,* VAR. *reflexa.*
Flowers all pedicelled, the pedicels exceeding the calyx; all the leaves capillary multifid .. .. 11. *L. Griffithii.*

1. LIMNOPHILA ROXBURGHII, G. Don Gen. Syst. IV. 543 (*not of* Benth.). A stout glabrous or pubescent aromatic herb, with a creeping rootstock and with decumbent rooting base, giving off numerous erect stems 1 to 2 feet high. *Leaves* opposite, petioled, elliptic or ovate, obtuse or sub-acute, margin crenulate, base cuneate, punctate beneath, nerves distinct, 8 to 10 pairs; length up to 4 in., width to 2 in.; petiole ·75 in. *Flowers* sessile, in axillary peduncled heads, rarely solitary. *Calyx* hirsute, ·2 in. long; lobes lanceolate, finely acuminate in fruit, not striate. *Corolla* ·35 in. long, purplish-blue with a yellow throat. *Capsule* ·2 in. long, elliptic, sub-acute. Hook. f. Flor. Brit. Ind. IV. 265. *L. Menthastrum*, Benth. in DC. Prod. X. 386; Maxim. Mel. Biol. IX. 406. *Herpestis rugosa*, Roth Nov. Sp. 290. *Capraria gratissima*, Roxb. Fl. Ind. III. 92 (*in part*). *Stemodia Menthastrum*, Benth. Scroph. Ind. 23; Wall. Cat. 3927. *Adenosma triflora*, Seem. Fl. Vit. 184 (*not of* Nees). *Eclipta scabriuscula*, Wall. Cat. 3212.

KEDAH: Langkawi, at Coah, *Curtis* 2556!—DISTRIB. Himalaya, from Chamba eastward, N. and C. India, Indo-China, Philippines, China.

The bases of the stems are often submerged, and besides the fibrous roots then emitted the lower nodes at times have multifid submerged leaves. The plant smells strongly of Aniseed.

2. LIMNOPHILA BALSAMEA, Benth. in DC. Prod. X. 386. A stoutish, softly pubescent herb; stem 1 to 2 feet high. *Leaves* opposite, elliptic, sub-acute, narrowed from the middle to the base with margin entire, beyond the middle obscurely crenulate, punctate beneath, nerves slender, 3 to 5 pairs; length up to 2 in., width to 1 in.; petiole 0. *Flowers* in short peduncled axillary heads or spikes. *Calyx* hirsute, ·15 in. long; lobes lanceolate, finely acuminate; in fruit striate. *Corolla* ·35 in. long. *Capsule* ·2 in. long, broadly elliptic, obtuse. Hook. f. Flor. Brit. Ind. IV. 266. *Stemodia balsamea*, Benth. Scroph. Ind. 23; Wall. Cat. 3928.

PERAK: *King's Collector* 1027!—DISTRIB. Indo-China.

3. LIMNOPHILA MICRANTHA, Benth. in DC. Prod. X. 387. A small, stoutish, glabrous herb, creeping below; stem 3 to 6 in. long, branching from the base. *Leaves* all opposite, crowded, thick, ·25 to ·45 in. long, margin entire or very sparingly sub-serrate, punctate beneath; nerves obscure; petiole 0. *Flowers* axillary, sub-sessile, small. *Calyx* ·06 in. long, glabrous; lobes subulate, in fruit striate. *Corolla* reddish-purple, ·12 in. long. *Capsule* ovate, ·08 in. long. Hook. f. Flor. Brit. Ind. IV. 267. *Stemodia micrantha*, Benth. Scroph. Ind. 23; Wall. Cat. 3936. *Herpestris pygmæa*, Griff. Notul. IV. 104.

PAHANG: *Ridley!*—DISTRIB. Indo-China, Bengal.

4. LIMNOPHILA VILLOSA, Bl. Bijdr. 750. An erect or spreading, sub-simple, stoutish or slender, pubescent herb; stems 4 to 6 in. high. *Leaves* opposite, elliptic-oblong, sub-crenate, ·5 to ·75 in. long, punctate beneath, nerves obscure; petiole 0. *Flowers* axillary, solitary, on short pubescent pedicels, ·15 in. long, erect in fruit. *Calyx* hirsute, ·15 in. long, lobes lanceolate, acuminate-subulate, in fruit striate. *Corolla* ·2 in. long. *Capsule* ·15 in. long, ovate. Benth. in DC. Prod. X. 388; Miq. Flor. Ind. Bat. II. 681. *L. laxa*, Benth. in DC. Prod. X. 388 *partly*. *L. pulcherrima*, Hook. f. Flor. Brit. Ind. IV. 267. *Herpestis pulcherrima*, Griff. Notul. IV. 104.

PERAK: *Wray* 788! MALACCA: *Griffith! Cuming! Maingay! Ridley! Hervey!* PENANG: Tulloh Bahang, *Curtis! Ridley* 7104! PAHANG: *Ridley!* SINGAPORE: *King's Collector! Hullett! Deschamps! Kurz! Ridley!* PROVINCE WELLESLEY: *King!* SALAMA: *Scortechini!*—DISTRIB. Sumatra, Java.

5. LIMNOPHILA HIRSUTA, Benth. in DC. Prod. X. 388. An erect hirsute herb; stem 6 to 8 in. high. *Leaves* opposite or 3–4-nately whorled, elliptic, linear-oblong or sub-spathulate, 1·5 to 2·5 in. long, apex obtuse, margin serrulate, punctate beneath, nerves few, very indistinct; petiole short or obsolete. *Flowers* axillary, solitary or cymose or paniculate at the apex of the stem; pedicels ·2 to ·75 in.

bracteoles minute. *Calyx* ·3 in. long, hirsute; lobes lanceolate, finely acuminate, in fruit striate. *Corolla* ·5 in. long. *Capsule* sub-orbicular, ·25 in. long. Hook. f. Flor. Brit. Ind. IV. 268. *L. javanica*, A. DC. in DC. Prod. X. 594. *Stemodia hirsuta*, Heyne, ex Wall. in Cat. 3930; Benth. Scroph. Ind. 24. *Ambulia ebracteata*, Ham. ex Hook. f. Flor. Brit. Ind. IV. 268.

NICOBARS: *Kurz!* PERAK: *Scortechini! Kunstler!* MALACCA: *Ridley!*—DISTRIB. India, Indo-China, Malay Archipelago, China.

6. LIMNOPHILA PYGMÆA, Hook. f. Flor. Brit. Ind. IV. 268. A very small, glabrous, much-branched creeping herb; branches 4 to 6 in. long, divaricate. *Leaves* opposite, ·3 to ·4 in. long, oblong-lanceolate, apex acute, margin sub-serrate; punctate beneath, nerves very obscure; petiole 0. *Flowers* axillary, solitary, pedicels slender, ·15 to ·2 in. long, erect in fruit. *Calyx* ·15 in. long, hirsute, lobes subulate-lanceolate, striate in fruit. *Corolla* ·2 in. long. *Capsule* ·15 in., ovate. *Herpestis pygmæa*, Griff. Notul. IV. 104. *Stemodia diffusa*, Benth. in Wall. Cat. 3937.

MALACCA: *Griffith! Cuming!*—DISTRIB. Tenasserim.

7. LIMNOPHILA ERECTA, Benth. in DC. Prod. X. 388. An erect, sub-simple or branched, stoutish glabrous herb; stems 4 to 8 in. high. *Leaves* all opposite, linear-oblong, ·5 to 1 in. long, apex acute, margin sub-serrate except the narrow cuneate base, punctate beneath, nerves obscure; petiole very short or obsolete. *Flowers* white, axillary, solitary, on short pedicels, ·1 in. long, recurved in fruit. *Calyx* glabrous, ·15 in. long, lobes lanceolate, acuminate, in fruit striate. *Corolla* ·2 in. long. *Capsule* ·15 in. long, ovate. Maxim. Mel. Biol. IX. 406; Hook. f. Flor. Brit. Ind. IV. 267. *Stemodia gratioloides*, Benth. Scroph. Ind. 25; Wall. Cat. 3938.

PERAK: *Scortechini! Wray! King's Collector!* NEGRI SEMBILAN: *Ridley!* SELANGOR: *Ridley!* PAHANG: *Ridley!*—DISTRIB. Indo-China, Bengal, S. China.

8. LIMNOPHILA GRATISSIMA, Bl. Bijdr. 749. An erect, glabrous herb with a stout stem, 1 to 2 feet high, simple or occasionally branched above. *Leaves* opposite and ternate, half-amplexicaul, linear-oblong, 1·5 to 2·5 in. long, apex sub-acute, margin serrulate, punctate beneath, nerves few, indistinct; petiole 0. *Flowers* in axillary and terminal many-flowered racemes, rarely flowers axillary solitary, sometimes the racemes 12 in. long and paniculately branched with the flowers whorled, at others the racemes reduced; pedicels ·5 to 1 in. long, glandular; bracteoles minute. *Calyx* ·3 in. long, glabrate, lobes lanceolate-acuminate; in fruit calyx hemispherical with lobes striate. *Corolla* ·5 in. long. *Capsule* oblong, acute, ·3 in. long. Benth. Scroph. Ind. 26;

Wall. Cat. 3906; Hook. f. Flor. Brit. Ind. IV. 268. *L. punctata*, Bl. Bijdr. 750; Benth. in DC. Prod. X. 388; Miq. Flor. Ind. Bat. II. 682; Maxim. Mel. Biol. IX. 406. *Gratiola aromatica*, Pers. Synops. I. 14. *Ambulia aromatica*, Lamk Encycl. Meth. I. 128. Rheede Hort. Malab. X. 6.

MALACCA: *Griffith.* PERAK: *King's Collector! Wray!*—DISTRIB. S.E. Asia generally, N. Australia.

9. LIMNOPHILA SESSIFLORA, Blume Bijdr. 750. A hirsute or rarely glabrate herb; stem stoutish, 4 to 8 in. long. *Leaves* 3 to 6 in a whorl throughout all lobulate or pinnatisect, or the uppermost very rarely opposite entire, usually about ·4 to ·5 in. long. *Flowers* axillary solitary, sessile or shortly pedicelled. *Calyx* ·3 in. long, lobes ovate-acuminate, tube in fruit membranous, hemispheric, not striate. *Corolla* ·5 in. long. *Capsule* orbicular, turgid, ·2 in. across. Benth. Scroph. Ind. 25; Wall. Cat. 3902; DC. Prod. X. 389; Miq. Flor. Ind. Bat. II. 683; Hook. f. Flor. Brit. Ind. IV. 270. *Hottonia sessiliflora*, Vahl Symb. II. 36.

KEDAH: Langkawi, in swamps, *Curtis!*—DISTRIB. Throughout S.E. Asia.

10. LIMNOPHILA HETEROPHYLLA, Benth.; var. *reflexa*, Hook. f. Flor. Brit. Ind. IV. 270. A glabrous herb with a very slender elongated stem, 1 to 1·5 feet long. *Leaves* towards apex of stem usually opposite, small, rarely over ·25 in. long, sessile, half-amplexicaul, oblong, margin crenulate; followed by pinnatifid leaves 4 to 6 in a whorl, ·5 in. long; with below these submerged whorled and very finely capillary-multifid leaves, ·5 in. long. *Flowers* axillary solitary, the upper sub-sessile passing into a short leafy spike, the lower pedicelled, with pedicels recurved in fruit and longer than the calyx. *Calyx* ·25 in. long, lobes ovate, very shortly acuminate, in fruit not at all striate; tube in fruit hemispheric, membranous. *Corolla* ·4 in. long. *Capsule* sub-globose, ·3 in. long. *L. reflexa*, Benth. Scroph. Ind. 25; DC. Prod. X. 389; Wall. Cat. 3904.

MALACCA: *Cuming.* KEDAH: *Curtis* 2103!—DISTRIB. (of variety,) Tenasserim: (of type,) throughout S.E. Asia.

This variety differs from the type in having distinctly shorter *submerged* leaves, and distinctly longer pedicels to the lower flowers.

11. LIMNOPHILA GRIFFITHII, Hook. f. Flor. Brit. Ind. IV. 271. A very small herb with creeping tufted stems, sending down long rigid roots and emitting many erect branches, 1 to 2 in. long, sometimes stout and stiff, sometimes slender and flaccid. *Leaves* ·25 to ·35 in. long, usually densely whorled and imbricated, multifid. *Flowers* axillary solitary, on slender pedicels, ·35 to ·5 in. long, that are deflexed

in fruit. *Calyx* ·1 in. long, teeth short. *Corolla* pure white, ·4 in. long. *L. sessiliflora*, Griff. Notul. IV. 99, t. 418, f. 5 (*not of* Bl.). *L. gratioloides* var. *myriophylloides*, Benth. in DC. Prod. X. 389 *partly*. *Quinquelobus glaber*, Benj. in Linnæa XX. 316. *Benjaminea glabra*, Benj. in Linnæa XX. 761.

MALACCA: *Griffith! Leman, Cuming! Maingay!* PERAK: *King's Collector!*

Griffith's specimens have slightly larger leaf-segments and shorter pedicels than those of Maingay, Cuming, and Kunstler, where the leaf-segments are finely capillary. But Griffith's plant evidently grew on mud, while that of Kunstler was floating in water, and the difference of habitat probably sufficiently explains the difference in foliage. The flowers of the two forms are the same.

5. HERPESTIS, Gaertn. f.

Herbs, glabrous. *Leaves* often dotted, entire or toothed, or below submerged and multifid. *Flowers* axillary or racemose; bracteoles small or obsolete. *Calyx* 5-partite; lobes imbricate, the upper largest, the two lateral inmost often very narrow. *Corolla* indistinctly 2-lipped; upper lip outmost spreading, 2-lobed or only emarginate, lower 3-lobed; tube cylindric. *Stamens* 4, didynamous, included; anthers sometimes approximate in pairs; cells contiguous, parallel, not confluent. *Ovary* 2-celled; ovules in each cell numerous; style dilated at the top; stigma entire or 2-lobed. *Fruit* a globose or ovoid 2-celled capsule; valves 2 or 4, separating from the placentiferous septum. *Seeds* many, very minute.—DISTRIB. Species about 50, throughout the tropics.

HERPESTIS MONNIERIA, H. B. & K. Nov. Gen. and Sp. II. 366. A glabrous, rather succulent creeping herb, rooting at the nodes; branches 4 to 10 in. long. *Leaves* obovate-oblong, spathulate, sessile, obtuse, entire, ·5 to ·75 in. long. *Flowers* axillary, peduncles usually ·75 to 1 in. long; bracteoles 2. *Calyx* of 5 nearly free sepals, ·2 to ·3 in. long, the upper sepal ovate. *Corolla* white, faintly tinged with blue, ·4 to ·6 in. long, lobes sub-equal. *Capsule* ovoid, acute, hidden by the sepals, ·15 to ·25 in. long. *Seeds* minute, irregular; testa pale. Benth. Scroph. Ind. 30, and in DC. Prod. X. 410; Wall. Cat. 3900; Dalz. & Gibs. Bomb. Flor. 178; Miq. Flor. Ind. Bat. II. 685; Bot. Mag. t. 2557; Boiss. Flor. Orient. IV. 426; Hook. f. Flor. Brit. Ind. IV. 272. *H. spathulata*, Bl. Bijdr. 748. *Gratiola Monnieria*, Linn. Cent. Pl. II. n. 120; Roxb. Cor. Pl. II. 41, t. 178, and Flor. Ind. I. 141. *Septis repens*, Lour. Flor. Cochin-Chin. 392. *Bramia indica*, Lamk Encyc. I. 459. Rheede Hort. Malab. X. t. 14.

MALACCA: *Hervey!* JOHORE: *Hullett!* SINGAPORE: *Kurz! Ridley!*—DISTRIB. Throughout the tropics.

6. TORENIA, Linn.

Herbs, glabrous or pubescent. *Leaves* opposite, entire or crenate or serrate. *Flowers* often showy, axillary, or in terminal or pseudo-axillary racemes or umbels; bracteoles 0. *Calyx* 2-lipped or 3–5-toothed, 3–5-keeled or -winged or -folded. *Corolla* 2-lipped; upper lip outmost erect, concave or pinched, notched or 2-fid; lower larger spreading, 3-lobed; tube cylindric, somewhat curved, dilated upwards. *Stamens* 4, didynamous; upper pair included inserted on corolla-tube; lower inserted on throat, appendaged or not at base, and connivent under upper lip; anthers contiguous or connate in pairs, cells often confluent. *Ovary* 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. *Fruit* a linear or oblong, included septicidal capsule; valves separating from the placentiferous septum. *Seeds* many, rugose or cancellate.—DISTRIB. Species 20, Tropical Asiatic and African, one American.

Calyx very distinctly winged:—
  Fruiting calyx sub-orbicular, as broad as long; stems prostrate and rooting .. .. 1. *T. polygonoides.*
  Fruiting calyx longer than broad; stems erect:—
    Wings broad distinctly decurrent on the pedicels; corolla very little exserted; bracteoles very small; pedicels shorter than the calyx .. .. 2. *T. peduncularis.*
    Wings narrow hardly decurrent on the pedicels; corolla distinctly exserted; bracteoles large; pedicels as long as or longer than the calyx .. .. 3. *T. ciliata.*
Calyx hardly or not at all winged:—
  Flowers all axillary:—
    Stems and leaves glabrous; calyx deeply lobed, faintly winged .. .. 4. *T. asiatica.*
    Stems and leaves hirsute; calyx wingless, shortly lobed .. 5. *T. Benthamiana.*
  Flowers in terminal racemes; stems and leaves hirsute; calyx wingless, shortly lobed .. .. 6. *T. flava.*

1. TORENIA POLYGONOIDES, Benth. Scroph. Ind. 39. A slender straggling herb; branches 6 to 12 in. long, decumbent and often rooting at the nodes; all parts glabrous. *Leaves* orbicular-ovate, serrate; lamina ·4 to ·5 in. long, ·35 to ·45 in. wide, apex acute or sub-acute, base cuneate; petiole slender, ·25 in. long. *Flowers* axillary on 2–4-flowered peduncles; pedicels ·25 in. long, slender; bracteoles minute. *Calyx* tubular with very wide wings, in fruit sub-orbicular ·3 in. in diam. *Corolla* ·35 in. long, white or white and pink, distinctly exserted. DC. Prod. X. 409; Miq. Flor. Ind. Bat. II. 688; Hook. f. Flor. Brit. Ind. IV. 276. *T. cardiosepala*, Benth. in DC. Prod. X. 409. *Herpestis polygonoides*, Benth. in Wall. Cat. 3897.

Singapore: *Wallich* 3897! *King's Collector! Hullett! Murton, Kuntze! Schomburgk! Anderson! Kurz!* Malacca: *Maingay! Griffith! Goodenough!* Penang: *Bouton; Deschamps!* Perak: Gapis Pass, *Curtis* 2683!

2. Torenia peduncularis, Benth. in Wall. Cat. 3956. An erect annual herb 1 to 2 feet high; branches acutely 4-gonous, uniformly hairy upwards, below ciliate only on the angles with recurved hairs. *Leaves* ovate-lanceolate, base cordate, apex acuminate, margin serrate; lamina membranous 1 to 2 in. long, ·5 to 1 in. wide, sparingly hairy on both surfaces; petiole slender, sparsely hirsute, ·5 to ·75 in. long. *Flowers* axillary solitary, or the uppermost in a sub-umbellate corymb or a terminal raceme, the lowest in the raceme leaf-opposed; pedicels ·3 in., in fruit ·5 in. long, thickened upwards, shorter than the calyx; bracteoles linear-subulate small. *Calyx-tube* narrow-ovate, ·6 in., in fruit ·85 in. long, wings broad, decurrent on the pedicel, the margins ciliate. *Corolla* ·75 in. long, little exserted, tube yellow below, pale blue above, lateral lobes of lip with darker blotches. *Stamens* with glabrous filaments not appendaged. *Disk* cupular. Hook. f. Flor. Brit. Ind. IV. 276. *T. edentula*, Benth. in DC. Prod. X. 410; Bot. Mag. t. 4229.

Penang: *Schomburgk!* Malacca: *Goodenough!* Perak: *Scortechini! Ridley* 9457! 9758! Ipoh, *Curtis!* Nicobars: Kamorta, *Kurz!*—Distrib. Indo-China, Java, Timor.

3. Torenia ciliata, Sm. in Rees Cyclop. V. 36. An erect annual herb, 1 to 2 feet high, branches acutely 4-gonous, uniformly hairy upwards, below ciliate only on the angles. *Leaves* ovate, base wide cuneate, apex obtuse or sub-acute, margin entire or crenate; lamina membranous 1·5 to 2·5 in. long, ·75 to 1·25 in. wide, sparingly hairy on both surfaces; petiole winged above ·25 to ·5 in. long, sometimes shorter. *Flowers* in distant pairs, racemed at the ends of the branches; pedicels ·3 in., in fruit ·4 in. long, thickened upwards, as long as or longer than the calyx; bracteoles ·3 in. long, linear, hirsute, as long as the flowering pedicels. *Calyx* very narrow-tubular, ·4 in., in fruit ·6 in. long, wings distinct but narrow, the margins ciliate. *Corolla* ·75 in. long, distinctly exserted, light blue. Benth. in DC. Prod. X. 411; Miq. Flor. Ind. Bat. II. 689; Hook. f. Flor. Brit. Ind. IV. 279. *T. racemosa*, Benth. Scroph. Ind. 38 (*not of* Griff.). *T. cærulea*, Miq. Flor. Ind. Bat. Suppl. 562. *T. flava*, Wall. Cat. 3957 (*in part*); Miq. Flor. Ind. Bat. Suppl. 562 (*not of* Ham).

Penang: *Wallich! Deschamps!* Perak: *King's Collector! Scortechini! Ridley!*—Distrib. Sumatra, Timor.

Very near to *T. peduncularis*, and really only separable by its smaller more winged calyx. It may be remarked that Kurz in Herb. Calcutta has suggested that *T. ciliata* is = *T. peduncularis*, while in the field Scortechini has named *T. peduncularis*, "*T. ciliata*."

4. **Torenia asiatica**, Linn. Sp. Pl. 619. A sub-erect or spreading slightly branching herb, stems quadrangular glabrous. *Leaves* ovate-lanceolate, base cuneate, margin finely serrate; lamina 1·5 to 2·5 in. long, 1 to 1·5 in. wide, membranous, glabrous; petiole slender, glabrous, ·5 in. long. *Flowers* axillary, pedicels ·5 in. long; bracteoles minute subulate. *Calyx* ·5 in. long, deeply 5-partite, lobes narrow-lanceolate, with a prominent midrib. *Corolla* 1·5 in. long, tube narrow-cylindric at base, infundibuliform above, dark violet on both sides, upper lobe erect, lip 3-lobed spreading, all yellowish. *Stamens* with appendages on anterior filaments. *Disk* cupular waved. Wight Ic. t. 862; Benth. in DC. Prod. X. 410; Wall. Cat. 3953 A. B.; Miq. Flor. Ind. Bat. II. 689; Gaertn. Fruct. III. 29, t. 184; Lamk Ill. t. 523; Bot. Mag. t. 4249; Lem. Ill. Hortic. t. 199; Flore des Serres II. t. 157; XIII. t. 1342; Hook. f. Flor. Brit. Ind. IV. 277. *Treisteria cordata*, Griff. Notul. IV. 109. Rheede Hort. Malab. IX. t. 53.

Perak: *Scortechini* 2212! *Ridley* 5307! 9756! *King's Collector* 1816! *Curtis!* Selangor: *Ridley* 8533!—Distrib. India, Sumatra, Java, Indo-China, China.

5. **Torenia Benthamiana**, Hance Ann. Sc. Nat. Ser. 4. XVIII. 226. A slender straggling herb; branches 6 to 10 in. long, decumbent and often rooting at the nodes, all parts sparingly hirsute. *Leaves* ovate, acute, margin serrate; lamina ·5 to ·75 in. long, ·3 to ·4 in. wide, base truncate or cuneate; petiole ·25 in. long. *Flowers* axillary, solitary, pedicels ·75 to 1·25 in. long, slender; bracteoles minute. *Calyx* very narrow-tubular, ·35 in. long, in fruit ·5 in. long, keeled and channelled but not winged, hirsute with sparse spreading hairs. *Corolla* 1·25 in. long, distinctly exserted; tube violet purple, limb yellow. *T. Bailloni* Godef. in Ill. Hortic. XXV. t. 324; E. Morr. in Belg. Hortic. XXIX. t. 9, f. 2. *T. flava*, Bot. Mag. t. 6700 (*not of* Ham.).

Johore: *Ridley* 4160!—Distrib. Siam, Cochin-China, S. China.

6. **Torenia flava**, Ham. in Wall. Cat. 3957. An erect annual herb, 1 to 2 feet high; branches acutely 4-gonous, uniformly hairy upwards, below ciliate only on the angles with spreading hairs. *Leaves* ovate or ovate-oblong, base wide-cuneate, margin entire or crenate; lamina membranous 1 to 1·5 in. long, ·7 to 1 in. wide, hairy on both surfaces; petiole winged above, often very short. *Flowers* racemed at the ends of the branches; pedicels ·2 in., in fruit ·3 in. long, thickened upwards, shorter than the calyx; bracteoles ·4 in. long linear, hirsute, rather longer than the fruiting pedicels. *Calyx* very narrow-tubular ·35 in., in fruit ·5 in. long, keeled and channelled but not winged, hirsute

throughout with sparse spreading hairs. *Corolla* ·75 in. long, distinctly exserted, bright yellow. Benth. Scroph. Ind. 38, and in DC. Prod. X. 414; Miq. Flor. Ind. Bat. II. 689; Hook. f. Flor. Brit. Ind. IV. 278. *Pentsteira racemosa*, Griff. Notul. IV. 120. *Mimulus hirsutus*, Bl. Bijdr. 756.

PERAK: *Kunstler* 904!—DISTRIB. Indo-China, Malaya.

7. VANDELLIA, Linn.

Herbs, glabrous or pubescent. *Leaves* opposite, often toothed, usually penninerved. *Flowers* small, axillary or racemose; bracteoles 0. *Calyx* campanulate, 5-toothed, or oftener deeply 5-partite, neither keeled nor winged. *Corolla* 2-lipped; upper lip outmost, erect, concave, emarginate or 2-fid; lower wider, spreading, 3-lobed; tube cylindric. *Stamens* 4, didynamous; the posterior pair inserted in corolla-tube, usually included, the anterior pair inserted on corolla-throat, with arched filaments appendaged near the base; anthers contiguous or connate in pairs under upper lip, cells divaricate. *Ovary* 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. *Fruit* a globose or ovoid, or long cylindric, septicidal capsule; valves separating from the placentiferous septum. *Seeds* many, small, rugose.—DISTRIB. Species about 30, mostly S.E. Asiatic.

Capsule about equalling or shorter than the calyx:—	
Calyx very shortly 5-lobed	1. *V. crustacea.*
Calyx divided almost to the base in 5 sepals:—	
Sepals longer than the capsule:—	
Stems erect; all parts sparsely beset with spreading hairs; leaves entire or sinuate..	2. *V. hirsuta.*
Stems procumbent; all parts softly villous; leaves crenate-serrate	3. *V. mollis.*
Sepals not longer than the capsule:—	
Leaves sessile	4. *V. scabra.*
Leaves petioled	5. *V. elata.*
Capsule much longer than the calyx	6. *V. pedunculata.*

1. VANDELLIA CRUSTACEA, Benth. Scroph. Ind. 35. A diffusely trichotomously branched, glabrous or sparsely hairy herb; branches mostly from near the root; stems 4 to 18 in. high. *Leaves* ovate or lanceolate, entire or serrate; lamina ·5 to 1 in. long, ·25 to ·5 in. wide; petioles short. *Flowers* axillary or sub-racemose; pedicels slender, strict, ·5 to 1·5 in. long. *Calyx* shortly 5-lobed, in flower ·1 in., in fruit ·15 in. long. *Corolla* pale purple or white. *Capsule* ovate-oblong, obtuse, ·12 in. long. DC. Prod. X. 413; Wight Ic. t. 863; Miq. Flor. Ind. Bat. II. 690; Hook. f. Flor. Brit. Ind. IV. 279. *V. alba*, Benth.

Scroph. Ind. 35. *Torenia varians*, Roxb. Fl. Ind. III. 96. *T. lucida*, Ham. in Wall. Cat. 3962. *T. alba*, Ham. in Wall. Cat. 3961 *partly*. *T. flaccida*, R. Br. Prod. 440. *Gratiola lucida*, Vahl Enum. I. 95; Roxb. Cor. Pl. II. 2, t. 202, and Flor. Ind. I. 138. *G. aspera*, Roth Nov. Pl. II. *Peristeira paniculata*, Griff. Notul. IV. 119. *Capraria crustacea*, Linn. Mant. 87. *Morgania lucida*, Spreng. Syst. II. 802. *M. aspera*, Spreng. Syst. II. 803. *Mimulus javanicus*, Bl. Bijdr. 283. *Hornemannia ovata*, Link & Otto Ic. Pl. Sel. I. 9, t. 3. *Tittmannia ovata*, Reichb. Icon. Exot. I. 27. *Antirrhinum hexandrum*, Forsk. Flor. Ægypt.-Arab. 43. Rumph. Herb. Amb. V. t. 170, f. 3.

PENANG: *Curtis!* PROV. WELLESLEY: *King!* PERAK: *Curtis!* SINGAPORE: *Wallich! Schomburgk! Ridley! Hullett! Kunstler! Deschamps! Kurz!* PAHANG: *Ridley!* MALACCA: *Hervey!*—DISTRIB. Cosmopolitan in the tropics.

2. VANDELLIA HIRSUTA, Benth. Scroph. Ind. 36. An erect succulent trichotomously branched herb, 4 to 6 in. high, sparsely clothed with spreading hairs. *Leaves* ovate or oblong, obtuse, entire or sinuate, 1 to 3 in. long; upper sessile ·5 to 1 in. wide, lower petioled, ·4 to ·75 in. wide. *Flowers* minute in many-flowered racemes; pedicels slender, ·15 to ·2 in. long. *Sepals* lanceolate ·08 in., in fruit ·1 in. long. *Corolla* blueish-white. *Capsule* orbicular ·08 in. in diam. DC. Prod. X. 414; Hook. f. Flor. Brit. Ind. IV. 280. *Tittmannia ovata*, Benth. in Wall. Cat. 3942. *T. viscosa*, Reichb. Ic. Exot. I. 26, t. 38. *Hornemannia prostrata*, Jacq. Ecl. t. 150.

PERAK: *Kunstler!* PAHANG: *Ridley!* SINGAPORE: *Ridley* 2701!—DISTRIB. S.E. Asia generally.

3. VANDELLIA MOLLIS, Benth. Scorph. Ind. 37. A procumbent herb; stems creeping below, 6 to 18 in. long, slender or stoutish, softly villous with spreading white hairs. *Leaves* ovate or ovate-oblong, obtuse or sub-acute, margin crenate-serrate; both surfaces softly villous with white glistening hairs; nerves 3 to 4 pairs, oblique, ascending; length 1 to 1·5 in., width ·5 to ·75 in.; petiole short, ·2 in. long or less. *Flowers* on axillary pedicels or in axillary or terminal racemes, the pedicels slender, softly villous, ·25 to ·75 in. long. *Sepals* subulate-lanceolate, softly villous with white hairs, ·4 to ·5 in. long. *Corolla* ·5 to ·6 in. long, tube white, upper lip brown and lower lip yellow. *Stamens* with filaments hirsute below, the upper pair with orbicular basal processes. *Capsule* oblong, ·2 in. in diam. DC. Prod. X. 414; Hook. f. Flor. Brit. Ind. IV. 281. *Tittmannia hirta*, Benth. in Wall. Cat. 3948.

SELANGOR: Rawang, *Ridley* 7605!—DISTRIB. Eastern Himalaya, S. China, Indo-China, Sumatra, Java.

4. VANDELLIA SCABRA, Benth. Scroph. Ind. 36. A slender diffusely branched herb with rather rigid stems and branches, the latter 2 to 4 in. long; more or less clothed everywhere with long white spreading hairs. *Leaves* broadly ovate or ovate-cordate, or orbicular, serrate or entire, acute or obtuse; lamina ·3 to ·6 in. long, ·3 in. wide. *Flowers* axillary or terminal, on slender capillary pedicels ·5 to 1·5 in. long, strict, spreading in fruit, much longer than calyx. *Sepals* lanceolate, hirsute or glabrous, ·1 in. long. *Corolla* ·3 in. long. *Capsule* orbicular ·1 in. long. DC. Prod. X. 414; Miq. Flor. Ind. Bat. II. 692; Griff. Notul. IV. 122, and Ic. Pl. Asiat. t. 418, f. 4; Hook. f. Flor. Brit. Ind. IV. 281. *V. monnierioides*, Ham. ex Hook. f. Flor. Brit. Ind. IV. 281. *Torenia hirta*, Cham. & Schlecht. Linnæa II. 571. *T. globosa*, Ham. ex Hook. f. Flor. Brit. Ind. IV. 281. *Gratiola pusilla*, Willd. Sp. Pl. I. 105. *Columnea minuta*, Roxb. Flor. Ind. III. 98. *Tittmannia pusilla*, Benth. in Wall. Cat. 3945 *partly*. *T. sulcata*, Wight in Wall. Cat. 3946 *partly*. *Bonnaya Vahlii*, G. Don Gen. Syst. IV. 538. *Stemodia minuta*, G. Don Gen. Syst. IV. 542. *Selago pusilla*, Thunb. Prod. Fl. Cap. 99.

MALACCA: *Griffith!* PROV. WELLESLEY: *King!* NEGRI SEMBILAN: Serembam, *Ridley* 10090! SINGAPORE: *King's Collector! Ridley!*—DISTRIB. S.E. Asia generally, Africa, Madagascar.

5. VANDELLIA ELATA, Benth. Scroph. Ind. 36. A slender, sub-erect or diffuse, glabrous or sparingly hirsute herb; stems simple or dichotomously branched, sometimes rooting near the base; branches slender, 6 to 8 in. long or longer. *Leaves* ovate, coarsely crenate-toothed, acute, base cuneate entire passing into the petiole; lamina ·3 to ·5 in. long, ·25 to ·3 in. wide; petiole ·15 to ·25 in. *Flowers* axillary or terminal, on slender capillary pedicels ·3 to ·5 in. long, strict, somewhat spreading in fruit, much longer than calyx. *Sepals* narrow-lanceolate, sparingly hirsute, ·09 in. long. *Corolla* very small, pale blue, ·1 in. long. *Capsule* broadly oblong, ·12 in. long, as long as the fruiting sepals. DC. Prod. X. 414; Hook. f. Flor. Brit. Ind. IV. 280. *Tittmannia elata*, Benth. in Wall. Cat. 3944.

SINGAPORE: *Ridley!*—DISTRIB. Tenasserim, Borneo.

6. VANDELLIA PEDUNCULATA, Benth. Scroph. Ind. 37. A slender glabrous herb, stem sometimes creeping at the base; branches slender, 4 to 10 in. long, prostrate. *Leaves* ovate, obtuse or sub-acute, obscurely crenate-toothed, ·5 to 1 in. long, ·4 in. wide, shortly petioled. *Flowers* axillary and in terminal racemes; pedicels slender 1·5 in. long, usually twice as long as leaves or longer. *Sepals* 5, narrowly lanceolate, free almost to the base, ·25 in. long. *Corolla* white, or pale blue with a white spot. *Capsule* linear-lanceolate, ·5 in. long. DC. Prod. X. 416;

Griff. Notul. IV. 120; Ic. Pl. Asiat. t. 418, f. 2; Hook. f. Flor. Brit. Ind. IV. 282. *V. Roxburghii*, G. Don Gen. Syst. IV. 549. *V. cordifolia*, G. Don. Gen. Syst. IV. 549. *Gratiola cordifolia*, Vahl Enum. I. 97; Don Prod. 85. *Bonnaya cordifolia*, Spreng. Syst. I. 42. *Tittmannia grandiflora*, Benth. in Wall. Cat. 3949. *Torenia diffusa*, Roxb. Fl. Ind. II. 95. *T. varians*, Griff. Notul. IV. 125 (*not of* Roxb.).

MALACCA: *Hervey!* SINGAPORE: *King's Collector! Thomson! Ridley!* JOHORE: *Ridley!* PERAK: *Wray! Scortechini! Ridley!* PENANG: *Curtis!*—DISTRIB. S.E. Asia generally.

8. ARTANEMA, Don.

Herbs with rather tall, erect, angled stems. *Leaves* opposite, entire or serrate, scabrid above as are the stem-angles. *Flowers* large, blue, pink or white, in terminal racemes; bracts leafy; bracteoles obsolete. *Calyx* 5-partite; lobes acuminate, smooth, much dilated. *Corolla* 2-lipped; upper lip outmost, erect, broad, emarginate; lower 3-lobed, spreading; throat not plicate; tube wide-cylindric. *Stamens* 4, didynamous; posterior pair short included, anterior pair long with arching filaments dilated at the base; anther-cells confluent at their tips. *Ovary* 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. *Fruit* a globose septicidal capsule; valves 2, separating from the placentiferous septum. *Seeds* many, small, rugose.—DISTRIB. Species 3 to 4, in tropics of Eastern Hemisphere and Australia.

Leaves shortly petioled; flowers over ·5 in. long ..	.. 1. *A. sesamoides.*
Leaves sessile, narrower; flowers under ·5 in. long..	.. 2. *A. angustifolium.*

1. ARTANEMA SESAMOIDES, Benth. Scroph. Ind. 39. A herb, 2 to 3 feet high. *Leaves* shortly petioled, lanceolate-acuminate, entire or serrate, 2 to 4 in. long, ·75 to 1·25 in. wide. *Flowers* in racemes 6 to 9 in. long; pedicels ·3 to ·5 in. long, usually slightly exceeding the calyx. *Calyx* of 5 sub-equal lobes, ·25 to ·3 in. long. *Corolla* blue, ·75 in. long. *Capsule* globose, ·3 in. in diam. DC. Prod. X. 408; Wight Ic. t. 1410; Miq. Flor. Ind. Bat. II. 686; Hook. f. Flor. Brit. Ind. IV. 274. *Columnea longifolia*, Linn. Mant. 90. *Achimanes sesamoides*, Vahl Symb. II. 71. *Diceros longifolius*, Pers. Synops. II. 164; Bl. Bijdr. 751; Wall. Cat. 3884.

PENANG: Pulo Boutong, *Curtis!*—DISTRIB. S.E. Asia generally.

2. ARTANEMA ANGUSTIFOLIUM, Benth. Scroph. Ind. 39. A herb, 2 to 3 feet high. *Leaves* sessile, lanceolate to linear-lanceolate, 3 to 4 in. long, ·25 to ·75 in. wide. *Flowers* in racemes 6 to 9 in. long; pedicels ·15 in. long, always shorter than the calyx. *Calyx* of 5 sub-equal sepals, ·2 in. long. *Corolla* pale blue and white, or pink or white, ·3 to ·4 in.

long. *Capsule* globose, ·2 in. in diam. DC. Prod. X. 408; Hook. f. Flor. Brit. Ind. IV. 275. *Diceros angustifolius*, Wall. Cat. 3885.

PENANG: *J. Scott! Ridley* 9412! PERAK: *Scortechini! Wray* 2246! 2721! *King's Collector* 3045! PAHANG: *Ridley* 2165A! SINGAPORE: *Wallich* 3885! SELANGOR: Sepang, *Ridley* 7604! JOHORE: Serom, *Ridley* 11134!

Very nearly related to *A. sesamoides*, which differs chiefly by its larger blue flowers and larger capsules.

9. CURANGA, Juss.

Herbs, creeping or diffuse. *Leaves* opposite, ovate, crenate. *Flowers* in short terminal or pseudo-axillary racemes; bracts small, leafy; bracteoles 0. *Calyx* deeply 4-partite; upper and lower lobes very large, lateral small and narrow. *Corolla* 2-lipped; upper lip outmost, wide-arched, emarginate; lower longer, spreading, 3-lobed; tube short. *Stamens* 2, only the upper pair perfect, included, inserted on corolla-tube; anthers connate with divaricate cells; lower pair of stamens replaced by 2 clavate staminodes on corolla-throat. *Ovary* 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. *Fruit* an orbicular septicidal capsule, covered by the accrescent calyx-lobes, valves separating from the broad placentiferous septum. *Seeds* many, rugose.—DISTRIB. Species 2, S.E. Asiatic.

CURANGA AMARA, Juss. Ann. Mus. IX. 320. An annual glabrous herb, with slender straggling divaricate branches, 2 to 3 feet long, rooting at the lower nodes. *Leaves* very bitter, ovate, crenate, obtuse or acute, base truncate rounded or cuneate, entire; blade 2 to 2·5 in. long, 1·5 to 2 in. wide; petiole very slender, ·5 to ·75 in. long. *Flowers* in short, few-flowered racemes, 2 to 2·5 in. long; pedicels ·25 to ·3 in., in fruit ·5 in. long. *Calyx* with the outer sepals broadly ovate-cordate, membranous, reticulate, in flower ·25 in., in fruit ·5 in. long. *Corolla* brownish-red. *Capsule* small, compressed, ·15 in. across. Benth. in DC. Prod. X. 408; Hook. f. Flor. Brit. Ind. IV. 275. *Caranga amara*, Vahl Symb. I. 100. *Gratiola amara*, Roxb. Flor. Ind. I. 136. *Herpestis amara*, Benth. Scroph. Ind. 30. *Symphillium torenioides*, Griff. in Madr. Journ. Nat. Sc. IV. 1, t. 11. *Treisteria assamica*, Griff. Notul. IV. 111. Rumph. Herb. Amboin. V. t. 170, f. 1.

PERAK: *Scortechini* 499B! *Ridley* 9742! PAHANG: *Ridley* 1346! SELANGOR: *Ridley* 8214!—DISTRIB. East Himalaya, Indo-China, Malaya, Philippines.

10. BONNAYA, Link & Otto.

Herbs, annual, glabrous. *Leaves* opposite, serrate or entire. *Flowers* solitary axillary, often passing into terminal racemes; bracteoles 0.

Calyx 5-partite; segments narrow, faintly imbricate. *Corolla* 2-lipped; upper lip outmost, erect, concave, 2-fid; lower larger, spreading, 3-lobed; tube cylindric. *Stamens* 2; upper pair alone perfect, subincluded; anthers contiguous, the cells divaricate; lower pair represented by 2 obtuse, glandular, entire staminodes on corolla-throat. *Ovary* 2-celled; ovules in each cell numerous; style slender; stigma 2-lamellate. *Fruit* a narrow, exserted, septicidal capsule; valves separating from the placentiferous septum. *Seeds* many, small, rugose. —DISTRIB. Species about 10, in tropics of Eastern Hemisphere.

Leaves sharply, closely, deeply serrate:—	
Leaves sessile; flowers white or pink; stems green ..	1. *B. brachiata.*
Leaves petioled; flowers purple; stems reddish	2. *B. reptans.*
Leaves remotely, shallowly serrate, or sub-entire; flowers violet-purple:—	
Leaves narrow-oblong	3. *B. veronicæfolia.*
Leaves lanceolate	3*b*. *veronicæfolia,* VAR. *verbenæfolia.*

1. BONNAYA BRACHIATA, Link & Otto, Ic. Pl. Sel. I. 25, t. 11. An erect rather rigid herb, 4 to 10 in. high; branches diffuse divaricate, the lowest decumbent below. *Leaves* oblong, obtuse or acute, margins thickened and sharply closely deeply serrate with teeth mucronate; lamina ·5 to 1·5 in. long; pedicels rigid about ·25 in long; bracts small. *Calyx* of 5 nearly free sepals ·25 in. long. *Corolla* white or pink, ·25 in. long. *Capsule* slender, spreading or erect, ·5 to ·6 in. long. Benth. in Wall. Cat. 3855, Scroph. Ind. 32, and DC. Prod. X. 420; Miq. Flor. Ind. Bat. II. 695; Hook. f. Flor. Brit. Ind. IV. 284. *B. serrata*, Griff. Notul. IV. 108. *B. pusilla*, Benth. Scroph. Ind. 33; Wall. Cat. 3861. *Gratiola serrata*, Roxb. Flor. Ind. I. 139, and ed. Carey & Wall. I. 140. Rheede, Hort. Malab. IX. t. 59.

SINGAPORE: *Wallich!* PAHANG: *Ridley!*—DISTRIB. India, Indo-China, China, Malaya, Philippines.

Wallich's Singapore specimen and one of Ridley's from Pahang belong to the form distinguished by Bentham as *B. pusilla*; another Pahang gathering (*Ridley* 2163) consists of genuine *B. brachiata*, from which, however, *B. pusilla*, though separable as a marked form, is hardly separable as a variety.

2. BONNAYA REPTANS, Spreng. Syst. I. 41. A prostrate creeping slender herb with reddish stem, branches and leaves beneath; branches diffuse spreading often 12 in. long. *Leaves* in distant pairs, obovate-oblong, obtuse, margins thickened and sharply serrate with mucronate teeth; base narrow-cuneate passing into a petiole ·25 in. long; blade ·75 to 1·25 in. long, ·5 in. wide. *Flowers* opposite in terminal racemes sometimes 3 to 4 in. long; pedicels rigid, ·25 in. long; bracts small.

Calyx of 5 nearly equal sepals, ·3 in. long. *Corolla* purple, ·75 in. long. *Capsule* very slender, spreading, 1 in. long. Benth. in DC. Prod. X. 420; Wall. Cat. 3856; Hook. f. Flor. Brit. Ind. IV. 284. *B. ruelloides*, Spreng. Syst. I. 41. *B. ciliata*, Spreng. Syst. I. 41. *Gratiola ciliata*, Koenig in Vahl Symb. I. 97. *G. ruelloides*, Koenig in Vahl Symb. I. 99. *G. reptans*, Roxb. Flor. Ind. I. 140. *Henckelia Roxburghiana*, Dietr. Sp. Pl. I. 572.

PENANG: *Curtis!* PERAK: *Scortechini! Wray!* PROVINCE WELLESLEY: *Ridley* 6985! PAHANG: *Ridley!* SINGAPORE: *Hullett! Ridley!*—DISTRIB. E. Himalaya, India, Indo-China, Malaya, Philippines.

3. BONNAYA VERONICÆFOLIA, Spreng. Syst. I. 41. A flaccid decumbent or creeping herb, with ascending branches 4 to 8 in. long. *Leaves* sub-sessile or narrowed into a short petiole, oblong or oblong-lanceolate or obovate, or lanceolate, obtuse or acute, margin distantly serrate or sub-serrate or sub-entire. *Flowers* opposite, in terminal leafy or naked racemes sometimes up to 6 in. long usually much shorter, pedicels rather flaccid, ·25 in. to ·35 in. long; bracts leafy or small. *Calyx* of 5 nearly equal sepals ·2 in. long. *Corolla* violet-purple, ·25 to ·35 in. long. *Capsule* slender, sub-erect or spreading, ·5 to ·6 in. long.

VAR. *typica*. *Leaves* usually obtuse, sometimes acute, always distantly serrate, 1 to 2 in. long, ·5 in. wide; racemes usually with leafy bracts; *corolla* ·25 in. long. *B. veronicæfolia*, Wall. Cat. 3857; Benth. in DC. Prod. X. 421; Wight Ic. t. 1411; Miq. Flor. Ind. Bat. II. 696; Hook. f. Flor. Brit. Ind. IV. 285. *B. marginata*, Spreng. Syst. I. 41. *B. rigida*, Benth. in Wall. Cat. 3859. *B. procumbens*, Benth. in Wall. Cat. 3860. *B. Rothii*, Dietr. Sp. Pl. I. 556. *B. bracteata*, Griff. Notul. IV. 107. *Gratiola veronicæfolia*, Retz Obs. IV. 8; Roxb. Pl. Corom. II. 30, t. 154; Fl. Ind. I. 138; ed. Carey & Wall. I. 139. *G. marginata*, Colsm. in Vahl Enum. I. 98. *G. racemosa*, Roth Nov. Sp. 9.

PENANG: Balli Pulo, George Town, &c. *Deschamps!* SINGAPORE: *King's Collector!* PAHANG: *Ridley!* MALACCA: *Hervey!* SELANGOR: *Ridley!* JOHORE: Serom, *Ridley!*—DISTRIB. Throughout S.E. Asia.

VAR. *verbenæfolia*, Hook. f. Flor. Brit. Ind. IV. 285. *Leaves* acute or sub-acute, distantly shallowly serrate or sub-entire, 1 to 1·5 in. long, ·2 to ·25 in. wide; racemes usually marked with minute bracts; *corolla* ·35 in. long. *B. verbenæfolia*, Benth. in DC. Prod. X. 421; Wall. Cat. 3858; Wight, Ic. t. 1412. *B. Roxburghiana*, Dietr. Sp. Pl. I. 559. *B. cyanea*, Griff. Notul. IV. 107. *Gratiola verbenæfolia*, Colsm. in Vahl Enum. I. 96. *G. ciliata*, Colsm. in Vahl Enum. I. 97. *G. racemosa*, Roxb. Fl. Ind. I. 138, and ed. Carey & Wall. I. 139. *G.*

Roxburghiana, Roem. & Schult. Syst. I. 123. *Tittmannia Colsmanni*, Benth. in Wall. Cat. 3950. *Torenia gracilis*, Benth. in Wall. Cat. 3952.

MALACCA: *Hervey!* PENANG: *Curtis!* PERAK: *Ridley! Scortechini!*—DISTRIB. Throughout S.E. Asia.

11. SCOPARIA, Linn.

Undershrubs or herbs with twiggy branches. *Leaves* opposite or whorled, glabrous or pubescent, entire or toothed, punctate. *Flowers* small, white or yellow, axillary, solitary or 2-nate; bracteoles 0. *Calyx* small, 4–5-partite; lobes imbricate. *Corolla* small, rotate, 4-lobed; lobes imbricate, sub-equal, obtuse; throat densely bearded; tube very short. *Stamens* 4, sub-equal; filaments filiform; anthers sub-sagittate, cells diverging or parallel, discrete. *Ovary* 2-celled; ovules in each cell numerous; style sub-clavate; stigma truncate or emarginate. *Fruit* a small, ovoid or globose, septicidal capsule; valves membranous, with inflexed margins, separating from the placentiferous septum. *Seeds* many, small, obovoid, angular, scrobiculate.—DISTRIB. Species about 6, all American.

SCOPARIA DULCIS, Linn. Sp. Pl. 116. A glabrous much-branched erect or ascending leafy undershrub with a strong perennial woody rootstock; stems 6 in. to 3 ft. high. *Leaves* opposite or ternate, lanceolate or elliptic-lanceolate, 1 to 2 in. long, ·5 to 1·5 in. wide, serrate, acute or obtuse, narrowed to a short petiole. *Flowers* many minute in terminal panicles; pedicles slender, strict, ·25 to ·4 in. long. *Sepals* 4, oblong. *Corolla* white, ·12 in. in diam., tube very short. *Stamens* sub-equal. *Capsule* globose, ·15 in. in diam. Voigt Hort. Suburb. Calcutt. 507; Benth. in DC. Prod. X. 431; Gaertn. Fruct. I. 251, t. 53, f. 10; Miq. Flor. Ind. Bat. II. 699; Hook. f. Flor. Brit. Ind. IV. 289.

PENANG: Kampai, Batu Gaja, &c., *King! Deschamps! Curtis!* SELANGOR: *Ridley!* PERAK: *Scortechini!* SINGAPORE: *Hullett! Kurz! King's Collector! Deschamps!*—DISTRIB. Everywhere in the tropics; originally American.

12. STRIGA, Lour.

Herbs, semiparasitic on roots, usually scabrid, discoloured when dry. *Leaves* opposite below, alternate above, linear, entire or rarely toothed sometimes reduced to scales. *Flowers* axillary, or the upper in bracteate spikes; bracteoles usually 2. *Calyx* 5-toothed or 5-fid, 5- or 10- or 15-ribbed, tubular. *Corolla* 2-lipped; upper lip inner in bud, usually shortly 2-fid or emarginate, lower 3-lobed; limb spreading; tube slender abruptly incurved at or above the middle. *Stamens* 4, didynamous, included; anthers 1-celled, vertical, dorsifixed, bases obtuse; connective sometimes mucronate. *Ovary* 2-celled; ovules in each cell numerous; style thickened upwards; stigma entire. *Fruit* an oblong or globose loculicidal capsule; valves entire, firm, septiferous, separating from the placentas. *Seeds* many, small, ovoid or oblong, reticulated.—DISTRIB. Species 20, in the tropics of the Eastern Hemisphere.

STRIGA LUTEA, Lour. Flor. Cochin-Chin. 22. A slender, erect, simple or fastigiately branched herb, 6 to 18 in. high; leaves and stems scabrid or villous. *Leaves* linear, ·5 to 1·5 in. long, ·12 in. wide. *Flowers* in elongated, usually interrupted spikes, 2 to 6 in. long; bracts usually exceeding the calyx, linear-lanceolate, scabrid. *Calyx* 10-ribbed, ·25 in. long, teeth 5, sub-equal. *Corolla* white or yellow or pink or purple, ·5 in. long, glabrous, incurved; upper lip emarginate reflexed; lower lip 3-lobed spreading. *Capsule* oblong, grooved, shorter than the calyx. Benth. in Hook. Comp. Bot. Mag. I. 363; Hook. f. Flor. Brit. Ind. IV. 299. *S. hirsuta*, Benth. in DC. Prod. X. 502; Dalz. & Gibs. Bomb. Flor. 181. *S. coccinea*, Benth. in DC. Prod. X. 364. *S. phœnicea*, Benth. in DC. Prod. X. 364. *Buchnera asiatica*, Linn. Sp. Pl. 630 *partly;* Roxb. Fl. Ind. III. 31; Benth. Scroph. Ind. 40. *B. coccinea*, Benth. Scroph. Ind. 40, Wall. Cat. 3870. *B. phœnicea*, Benth. Scroph. Ind. 40; Wall. Cat. 3874. *Campuleia coccinea*, Hook. Flor. Exot. t. 203. Rheede Hort. Malab. IX. t. 66.

PENANG: *Curtis* 1840! PAHANG: *Ridley!* SINGAPORE: *Ridley* 139; *Kurz!* ANDAMANS: Port Blair, *King! Prain!*—DISTRIB. Throughout S.E. Asia, Arabia, Madagascar, Africa.

13. CENTRANTHERA, R. Br.

Herbs, semiparasitic, annual, rigid, scabrous. *Leaves* opposite throughout, or opposite below alternate above, oblong or linear, obtuse, entire or toothed. *Flowers* axillary, or in bracteate spikes or racemes; bracteoles 2. *Calyx* compressed, spathaceous, split on one side, acuminate entire, or shortly 3–5-lobed on the other. *Corolla* 5-lobed; lobes sub-equal, spreading, the 2 upper inmost in bud; limb oblique; tube long, incurved. *Stamens* 4, didynamous, included; anthers contiguous in pairs; cells transverse, spurred or mucronate at base, one cell often sterile. *Ovary* 2-celled; ovules in each cell numerous; style simple, dilated above; stigma acute, linguiform. *Fruit* an ovoid or sub-globose loculicidal capsule; valves entire, carrying away the placentas. *Seeds* many, small, oblong-cuneate; testa lax, reticulate.—Distrib. Species 4–5, E. Asiatic and Australian.

Centranthera humifusa, Wall. Cat. 3883. A dwarf herb, diffusely branching from the base, hispid or glabrous, branches 3 to 6 in. long. *Leaves* linear, entire, ·5 to ·75 in. long. *Flowers* in terminal spikes, sub-sessile; bracts small. *Calyx* ovoid, sub-acute, ·15 in. long. *Corolla* yellow, ·3 to ·5 in. long, incurved. *Capsule* sub-globose, ·15 in. wide. Benth. in DC. Prod. X. 525; Hook. f. Flor. Brit. Ind. IV. 301. *Razumovia tranquebarica*, Spreng. Syst. II. 812. *Torenia lepidota*, Roth Nov. Sp. 281.

Malacca: *Griffith!* Singapore: *Kurz!*—Distrib. China, Indo-China, India, Malaya.

Order LXXXIV. OROBANCHACEÆ.

[By D. Prain.]

Root-parasites, annual, white or reddish. *Stem* simple or branched, stout or slender, clothed with leaf-scales. *Leaves* proper 0. *Flowers* solitary or in spikes or racemes, irregular. *Sepals* 4–5, usually connate in a variously toothed or spathaceous calyx, rarely free. *Corolla* hypogynous, 2-lipped; upper lip vaulted, lower lip 3-lobed; throat often with 2 villous folds; tube curved. *Stamens* 4, didynamous, inserted on corolla-tube; anthers 1–2-celled; cells spurred at the base, dehiscence by slits or basal pores; one cell sometimes imperfect. *Disk* unilateral or glandular or obsolete. *Ovary* of 2 connate carpels, usually 1-celled; style long, tip curved; stigma 2-lobed, sub-capitate; ovules usually numerous on generally 2 pairs of free or confluent parietal placentas which sometimes meet in the axis of the ovary. *Capsule* 1-celled, 2-valved; *seeds* usually many, minute, with a pitted or tubercled, rarely reticulate and lax testa; albumen fleshy; embryo ovoid, entire or 2-fid.

Æginetia, Linn.

Leafless parasitic herbs with simple or branched naked or scaly stems or scapes. *Flowers* few, large, solitary or corymbose; bracteoles 0. *Calyx* spathaceous, split in front almost to the base. *Corolla* incurved, campanulate-tubular; limb obscurely 2-lipped, lobes somewhat spreading, the two upper lobes (upper-lip) connate. *Stamens* included; anthers with one perfect cell adnate to filament and not spurred; the other cell absent in upper anthers, empty clavate and deflexed in the lower. *Ovary* 1-celled; placentas large, 2-lobed or multifid, filling the chamber, ovuliferous throughout; style slender;

stigma large peltate. *Capsule* partially 2-valved. *Seeds* many, small, crowded; testa pitted.—DISTRIB. Species 3, S.E. Asiatic.

ÆGINETIA PEDUNCULATA, Wall. Pl. As. Rar. III. 13, t. 219. A leafless herb, 3 to 6 in. high; stems red or yellow, parasitic on roots, buried, emitting several short stout fleshy several-flowered scapes with alternate peduncled flowers; peduncles 1 to 4 in. long, stout, bracteate at base; bracts ·25 to ·35 in., ovate, obtuse. *Calyx* 1·5 to 2 in. long, fleshy, dull-pink at length yellowish-white, with a mucilaginous pad surrounding base of corolla, tip acute or obtuse. *Corolla-tube* yellow or white, the lobes violet or claret-coloured, crenate and erose. *Stamens* didynamous, anthers of lower pair with a large dorsal fleshy decurved horn. *Ovary* 1-celled, placentas 2, each of 2 plates; stigma cordate-peltate. *Capsule* ovoid. *Seeds* brown. Reut. in DC. Prod. XI. 43; Wight Ill. t. 158B, f. 6; Ic. t. 1421; Hook. f. Flor. Brit. Ind. IV. 320. *Æ. abbreviata*, Ham. in Wall. Cat. 3965; Benth. Scroph. Ind. 95; Reut. in DC. Prod. XI. 43. *Æ. acaulis*, Walp. Rep. III. 481; Reut. in DC. Prod. XI. 43. *Orobanche pedunculata*, Roxb. Hort. Beng. 45; Fl. Ind. iii. 29. *O. acaulis*, Roxb. Cor. Pl. III. 89, t. 292, and Fl. Ind. III. 29.

PERAK: Batang Padang Valley, 2,000 feet; *Wray* 1456! 1457!—DISTRIB. India, Indo-China, Java, Sumatra.

One of Wray's specimens is attached to the rhizome of a *Kæmpferia*.

CHRISTISONIA, Gardn.

Low fleshy scaly parasitic herbs, with yellow or white or rose-purple flowers; *stems* simple or tufted from a short or long rootstock; *scales* alternate, obtuse or acute. *Flowers* densely or laxly corymbose; bracteoles 2 or 0. *Calyx* tubular, terete or angular, 2–5-lobed or -toothed. *Corolla-tube* long, inflated or funnel-shaped, slightly or distinctly curved, 5-lobed, obscurely to distinctly 2-lipped, the two upper lobes (in our species outer in bud) sub-erect, the lower spreading. *Stamens* 4, included or sub-exserted; filaments stout; anthers with one perfect cell and one imperfect, one pair sometimes spurred or appendaged; rarely with both cells perfect. *Disk* 0. *Ovary* 1-celled with two 2-partite placentas, or 2-celled from the placentas meeting in the axis; style long, tip incurved, stigma large, 2-lobed, the upper lobe very small or obsolete, the lower (sometimes the only one present) very large orbicular or clavate; ovules numerous. *Capsule* ovoid or subglobose, loculicidal. *Seeds* minute, crowded, many perfect with striate testa, others imperfect with lax testa; embryo half as long as the albumen.—DISTRIB. Species 12, tropical Asiatic.

CHRISTISONIA SCORTECHINII, Prain in Journ. As. Soc. Beng. LXXIII. 2. 205. *Stem* short hypogæal, covered with linear scales. *Flowers* 3 to 8, crowded in a dense corymb; some shortly peduncled, others sessile, each with an oblong cucullate basal bract ·75 in. long; all parts loaded with sticky mucilage. *Calyx* spathaceous, rupturing into usually 2 (sometimes, *fide* Scortechini, into 2 to 4) lobes, in the fully opened flower with tube 1 in., lobes ·25 in. long. *Corolla-tube* white, with a yellow line inside in front, 2 in. long, infundibuliform and curved above, the lower part narrow-cylindric 1 in. long; limb 2-labiate, upper lip outmost in bud, erect, 2-lobed, lower lip 3-lobed, spreading. *Stamens* didynamous; anthers all conniving; filaments glabrous, inserted below middle of corolla-tube, 1-celled, adnate to the enlarged filament, upper pair without, lower with an empty oblong pointed cell. *Disk* 0. *Ovary* glabrous, 1-celled, placentas 2, 2-fid, uniformly covered with ovules; style glabrous downwards; stigma peltate, flat; ·2 in. in diam.

PERAK: *Scortechini*, 2121!

Order LXXXV. LENTIBULARIACEÆ.

[By D. PRAIN.]

Marsh or aquatic herbs, or occasionally growing on wet rocks. *Leaves* radical, rosulate or when submerged capillary-multifid, sometimes obsolete. *Flowers* irregular, hermaphrodite, on 1–many-flowered simple or branched scapes; bracts small, sometimes 0; bracteoles under calyx 2 or 0. *Calyx* inferior, 2–5-lobed. *Corolla* 2-lipped and spurred; upper lip usually the smaller, entire or emarginate; lower lip 3–6-lobed. *Stamens* 2, adnate to the base of the corolla, alternate with the lobes of the lower lip; filaments widely curving, anther-cells ovate, transversely confluent; dehiscence longitudinal. *Carpels* 2, connate in a superior, globose, 1-celled ovary; ovules very many, on a free basal placenta; style short; stigma unequally 2-lobed. *Fruit* a globose 2–4-valved, or irregularly rupturing capsule. *Seeds* very many, minute; albumen 0.—DISTRIB. Species nearly 200, in all parts of the world.

UTRICULARIA, Linn.

Herbs, often very small, submerged or floating, or growing on wet rocks. *Leaves* in submerged or floating species multifid, with capillary segments, in erect or twining species entire; often disappearing at time of flowering, frequently with minute bladders. *Flowers* on simple or branched scapes, racemes few- or many-flowered; bracts and 2 bracteoles distinct. *Calyx* 2-partite; lobes entire or nearly so, often accrescent. *Corolla* 2-lipped; upper lip entire or emarginate; lower larger 3–6-lobed; tube with a straight or curved spur. *Stamens* 2, adnate to base of corolla, alternate with lobes of lower lip; filaments broad; anthers ovate, 2-celled, or by confluence almost 1-celled. *Carpels* connate in a globose 1-celled ovary; ovules many, on a central placenta; style short; stigma unequally 2-lobed. *Capsule* globose, regularly 2–4-valved, or opening irregularly. *Seeds* many, small; albumen 0.—DISTRIB. Species 150, in most countries.

- Leaves many, submerged, scattered, divided into numerous capillary segments mostly interspersed with bladders; calyx-lobes equal or nearly so; pedicels not winged:—
  - Flowers yellow to pale-yellow or nearly white:—
    - Peduncles very slender; flowers usually two, never more than three, always under ·25 in. across; pedicels in fruit erect: sometimes the capillary leaves absent .. .. 1. *U. exoleta.*
    - Peduncles stout; flowers usually more than three, and always from ·35 to ·5 in. across; pedicels reflexed in fruit and thickened under the calyx .. .. .. 2. *U. flexuosa.*
  - Flowers blue or red or pink; pedicels erect in fruit .. 3. *U. punctata.*
- Leaves few, rosulate at base of stem:—
  - Leaves linear or linear-spathulate, usually absent at time of flowering; calyx-lobes equal or nearly so; seeds not glochidiate:—
    - Scales of the scape and bracts attached by their bases:—
      - Stems erect:—
        - Flowers yellow; pedicels in fruit distinctly winged .. 4. *U. bifida.*
        - Flowers pink, purple, or violet, rarely white with lilac markings:—
          - Pedicels in fruit slightly winged; sometimes a few leaves still present at time of flowering; stems 8 to 12 in. high, stoutish .. .. .. 5. *U. affinis* VAR. *Griffithii.*
          - Pedicels in fruit capillary, short, wingless; leaves 0 at time of flowering; stems ·2 to 3 in. high, very slender .. .. 6. *U. minutissima.*
      - Stems twining; flowers yellow:—
        - Stems slender, leaves absent at time of flowering; lower lip less than ·25 in. wide .. .. .. 7. *U. Wallichiana.*
        - Stems stouter; leaves forming matted masses; lower lip over ·3 in. wide .. .. 8. *U. involvens.*
    - Scales of the scape and bracts produced downward below point of attachment:—
      - Flowers on distinct pedicels as long as the fruiting calyx or longer; capsule longer than fruiting calyx-lobes; flowers pink (*Ridley*) .. .. 9. *U. verticillata.*
      - Flowers almost or quite sessile; capsule hidden by the fruiting calyx-lobes:—
        - Flowers few, scattered on the very slender scapes; corolla white .. .. 10. *U. racemosa* VAR. *filicaulis.*

Flowers many or few, congested at the ends of the stouter rigid scapes and branches; corolla rarely pure white .. .. 11. *U. ophirensis.*
Leaves orbicular or spathulate-orbicular, persistent; calyx-lobes very unequal, the upper the larger; seeds glochidiate; stems very slender, lip pale-violet or white with a yellow centre .. 12. *U. orbiculata.*

1. **Utricularia exoleta**, R. Br. Prod. 430. A water-weed, sometimes floating with very slender stems and submerged divided capillary leaves, the segments interspersed with bladders; sometimes growing in mud with capillary leaves absent and with tufted setaceous leaves. *Scapes* slender, naked, or with one or two scale-like bracts, 2 to 4 in. long, usually 2-flowered, occasionally 3-flowered, sometimes 1-flowered, then often with an abortive axis or flower-bud opposite the bract; pedicels slender, erect, the lowest ultimately ·4 in. long; bracts very small, obtuse, basifixed; bracteoles 0. *Calyx* 2-lobed; lobes slightly unequal, ovate-obtuse or sub-orbicular, in fruit adpressed to the capsule, ·1 in. long. *Corolla* yellow, ·2 in. across; spur cylindric-conical, twice as long as lower calyx-lobe and slightly exceeding lower lip of corolla, which has an entire margin and embraces the base of the spur. *Capsule* almost globose, ·15 in. in diam. *Seeds* sub-trapezoid-discoid, margin thin, spreading, minutely crenulate. A. DC. Prod. VIII. 7; Hook. f. Flor. Brit. Ind. IV. 329; Ridl. Journ. Bot. XXXIII. 10. *U. diantha*, Roem. & Schult. Syst. Veg. I. 169; Wight Ic. t. 1569; Oliv. Journ. Linn. Soc. III. 175. *U. diflora*, Roxb. Hort. Beng. 4. *U. biflora*, Roxb. Fl. Ind. I. 143, nec alior. *U. Roxburghii*, Spreng. Syst. I. 52. *U. elegans*, Wall. Cat. 1502. *U. pterosperma*, Edgew. Proc. Linn. Soc. I. 352.

Perak: Sunga Ryah, *King's Collector* 891! 4383! *Ridley!* Singapore: *Ridley.* Prov. Wellesley: *Ridley!* Johore: Parit Lombong, *Ridley!* Pahang: Kwala Pahang, *Ridley!* Nicobars: Kamorta, *Kurz!* —Distrib. S.E. Asia, N. Australia.

2. **Utricularia flexuosa**, Vahl Enum. I. 198. A floating water-weed with submerged divided capillary leaves, the segments interspersed with bladders; occasionally with narrow, oblong, floating vesicles 1 to 3 in. long, beset with capillary leaves, scattered or sometimes whorled near or occasionally above the base of the scapes. *Scapes* 3 to 10 in. long, 3–12-flowered; pedicels stout, reflexed, and slightly thickened under the calyx in fruit, ultimately ·3 to ·5 in. long; bracts ovate-acute, basifixed; bracteoles 0. *Calyx* 2-lobed, lobes sub-equal, ovate-sub-acute, in fruit patent, ·25 in. long. *Corolla* yellow, rarely white, ·3 to ·5 in. across; spur somewhat longer than lower calyx-lobe, and about as long as lower lip of corolla, stoutish, bluntish, straight or somewhat curved. *Capsule* compressed, sub-globose, ·25 in.

long. *Seeds* thickly discoid, margin thin, incurved towards the concave face, usually 5-6-angled. Bl. Bijdr. 739; A. DC. Prod. VIII. 24; Oliv. Journ. Linn. Soc. III. 175; Hook. f. Flor. Brit. Ind. IV. 329; Ridl. Journ. Bot. XXXIII. 10. *U. australis*, R. Br. Prod. 430; A. DC. Prod. VIII. 6. *U. fasciculata*, Roxb. Fl. Ind. I. 143; Wall. Cat. 1499; A. DC. Prod. VIII. 7; Wight Ic. t. 1568; Miq. Flor. Ind. Bat. Suppl. 246. *U. confervifolia*, Don Prod. 84; A. DC. Prod. VIII. 8. *U. inæqualis*, Benj. Linnæa XX. 304. *U. Blumei*, Miq. Fl. Ind. Bat. II. 994. *U. extensa*, Hance in Walp. Ann. III. 3.

MALACCA: *Ridley!* PAHANG: Kwala Pahang, *Ridley!* PERAK: *Scortechini!* Durian S. Batang, *King's Collector* 1086! SINGAPORE: *Ridley* 5642, 9844! KEDAH: Langkawi, *Curtis!*—DISTRIB. S.E. Asia, N. Australia.

Forma gracilis, Oliv. Journ. Linn. Soc. III. 175 (= *U. inæqualis*, Benj.) more slender in all its parts and with smaller paler yellow flowers.

SINGAPORE: *King's Collector* 1165! *Hullett* 36! 385! MALACCA: *Cuming! Goodenough* 1407! *Ridley!* PROV. WELLESLEY: *Ridley!*

The very similar and nearly allied *U. stellaris*, distinguished most easily by the presence of a cluster of oblong vesicles about the *middle* of the peduncle, has not been reported so far from the Malayan Peninsula.

King's Collector's field-note on the slender form, which the writer agrees with Oliver in considering no more than a form of *U. flexuosa*, is as follows: "Herbaceous plant, in clear pools of fresh water; colour bright green. Flowers pale yellow. I sent a similar one from Durian S. Batang, but I don't think the same." His field-note on genuine *U. flexuosa* is as follows: "Growing in muddy pools of water; colour a dark reddish-brown, tinged with green; flower bright yellow."

In his interesting paper on the *Utricularias* of the Malay Peninsula (*Journ. Bot.* for 1895, pp. 10, 11) Mr. Ridley gives as localities for *U. flexuosa* Pahang and Kedah, Langkawi, but does not differentiate the two forms. The leaves, he remarks, are used in medicine by the Malays, who call it Lumut Ekor Kuching (Cat's Tail Moss) or Lumut Ekor Kuning (Yellow Tail Moss).

3. UTRICULARIA PUNCTATA, Wall. Cat. 2121. A floating water-weed, with submerged divided capillary leaves, the segments interspersed with bladders, often with narrow, oblong, floating vesicles 1 to 3 in. long, beset with capillary leaves, near the base of the scapes. *Scapes* 4 to 12 in., usually many-flowered; pedicels slender, ascending or sub-erect in fruit, ultimately ·5 to ·6 in. long; bracts ovate, more or less acute, slightly produced beyond base; bracteoles 0. *Calyx* 2-lobed, lobes sub-equal, ovate-rotund, obtuse, ·1 in. long. *Corolla* blue, reddish-purple or pink, ·25 in. across, spur somewhat longer than lower calyx-lobe, shorter than lower lip of corolla, thick, sub-cylindric, obtuse. *Capsule* thin, ovate-oblong, obtuse, ·2 in. long. *Seeds* discoid, peltate,

margin winged throughout, wing deeply, sharply toothed. A. DC. Prod. VIII. 5; Wight Ic. t. 1570; Oliv. in Journ. Linn. Soc. III. 175; Hook. f. Flor. Brit. Ind. IV. 329; Ridl. Journ. Bot. XXXIII. 10.

PAHANG: Chenei Lake, *Fox!*—DISTRIB. Borneo, Tenasserim.

4. UTRICULARIA BIFIDA, Linn. Sp. Pl. 26. A slender erect weed of wet places; leaves radical, linear-spathulate, disappearing before flowering, ·3 to ·5 in. long; roots fibrous, sometimes with a few bladders. *Scapes* 2 to 10 in. long, 2–many-flowered, beset with a few basifixed ovate-acute scales or empty bracts; pedicels short, in flower ·12 in., in fruit ·2 in. long, recurved and distinctly winged from the decurrent calyx, with ovate-acute basal bracts. *Calyx* 2-lobed; lobes sub-equal, ovate-obtuse, ·25 in. long. *Corolla* yellow, ·25 in. wide; spur longer than the lower calyx-lobe and as long as the lower lip of the corolla, slightly falcate. *Capsule* ovate, ·2 in. long, hidden by the calyx. *Seeds* obovoid, testa lax, scrobiculate, obliquely striate. A. DC. Prod. VIII. 21; Oliv. Journ. Linn. Soc. III. 182; Hook. f. Flor. Brit. Ind. IV. 332; Ridl. Journ. Bot. XXXIII. 10. *U. biflora*, Wall. Cat. 1498 (*not of* Roxb.). *U. diantha*, A. DC. Prod. VIII. 21 (*not of* Roem. & Schult.). *U. Wallichiana*, Benj. Bot. Zeit. 1845 214 (*not of* Wight). *U. brevicaulis*, Benj. Linnæa XX. 303.

PENANG: *Curtis!* SELANGOR: *Ridley!* PERAK: Larut, *Scortechini!* Selama, growing among grass in swampy places, *Wray* 4263! *Ridley!* PROV. WELLESLEY: in wet and swampy places, *King's Collector* 1616! SINGAPORE: in wet, sandy hollows, *Kurz* 2973! *Ridley!* MALACCA: *Griffith! Hervey! Ridley!* PAHANG: Kwala Pahang, *Ridley* 1481! KEDAH: *Curtis.*—DISTRIB. Throughout E. and S.E. Asia.

Mr. Ridley has seen specimens of this species from the Dindings and from Penang, also from Kedah, Langkawi. He finds two rather distinct forms, a small-flowered, plain yellow one and a form with larger flowers over ·25 in. long with a darker orange centre; this latter Ridley found in Pahang growing with the common form.

5. UTRICULARIA AFFINIS, Wight; var. *Griffithii*, Oliv. Journ. Linn. Soc. III. 179. A slender erect weed of wet places. *Leaves* radical, linear or linear-spathulate, obtuse, very often persisting during flowering, ·5 to ·7 in. long; roots fibrous, sometimes with a few bladders. *Scapes* 5 to 12 in. long, usually many-flowered; beset with a few basified ovate-acute scales or empty bracts; pedicels short, ·1 in. long in flower, in fruit ·15 in. long and slightly winged by the decurrent calyx, erect or ascending, never recurved and rarely patent, with ovate-acute basal bracts. *Calyx* 2-lobed; lobes sub-equal, ovate or sub-orbicular, acute or sub-cuspidate, ·25 in. long. *Corolla* blue with whitish lines, ·25 in. wide; spur slightly longer than the lower calyx-

lobe and the lower lip of the corolla. *Capsule* ovate, ·2 in. long, hidden by the calyx. *Seeds* obovoid, reticulate, cells of the testa sub-hexagonal. *U. Griffithii*, Wight Ic. t. 1576; Ridl. Journ. Bot. XXXIII. 10. *U. cærulea*, Benth. Fl. Hongk. 256 (*not of* Linn.).

Malacca: *Griffith! Ridley!* Perak: *Scortechini!* Singapore: *Hullett! Ridley!*—Distrib. China, Burma, Tenasserim, Borneo.

There are only shrivelled leaves on Ridley's and Wight's specimens, which are mostly in fruit; Scortechini's specimens, which are in flower, have numerous radical grassy linear-spathulate obtuse leaves, ·5 in. long or rather longer. Mr. Ridley, in all probability rightly, considers that this is entitled to specific rank apart from *U. affinis*.

6. Utricularia minutissima, Vahl Enum. I. 204. A very small erect weed of wet places; leaves 0 at time of flowering and not seen; roots fibrous, bladders not seen. *Scapes* capillary, rigid, branched, 2 to 3 in. long, quite glabrous, or with a few rigid scattered black hairs; racemes 2–5-flowered, beset with a few basifixed ovate-acute empty bracts or scales; pedicels very short, in fruit only ·05 in. long, occasionally like the upper calyx-lobe with a few straight black hairs, sub-patent, with small lanceolate basifixed bracts and bracteoles, less than half as long as their pedicels. *Calyx* 2-lobed, lobes sub-equal wide-oblong, obtuse, in fruit ·1 in. long. *Corolla* mauve, ·15 in. wide; spur wide-conic-cylindric, thrice as long as lower calyx-lobe and twice as long as lower lip of corolla. *Capsule* oblong, ·07 in. long, covered by the calyx. *Seeds* minute, ovoid, obscurely scrobiculate. A. DC. Prod. VIII. 16; Oliv. Journ. Linn. Soc. III. 190; Hook. f. Flor. Brit. Ind. IV. 334; Ridl. Journ. Bot. XXXIII. 11.

Perak: Larut, *Scortechini* 1501! Pahang: Kwala Pahang, *Ridley* 1474c *in part!* Malacca: *Koenig;* on Mount Ophir, *Ridley*.

This small plant, collected by Scortechini with no note of colour, and stated by Ridley to have mauve flowers, is here identified with *U. minutissima*, Vahl, from description only. The branched capillary stems render it very like and very liable to be mistaken for small specimens of *U. verticillata*, which has, however, longer pedicels and bracts produced below their point of insertion. The presence of hairs on the stems, pedicels, and sometimes the calyx, at once suggests a reference to *U. hirta*, which is undoubtedly its nearest affinity. The scape, however, appears never to branch in *U. hirta;* the flowers in that species are larger and fewer; the pubescence, too, when present in *U. minutissima*, which is not always the case, is very different, consisting of rigid patent black bristly hairs, whereas in *U. hirta* the hairs are soft and grey or tawny. The seeds of the two species are very similar, but those of *U. minutissima* are smaller and yet have fewer- and larger-meshed sub-hexagonal reticulations.

7. Utricularia Wallichiana, Wight, Ic. t. 1572, fig. 1. A very slender herb growing in wettish fields and damp grassy places; stems

twining, thin, 6 to 8 in. long. *Leaves* linear-spathulate, absent at time of flowering; bladders not seen. *Flowers* small, racemose or subspicate at ends of stems; pedicels sometimes absent, sometimes up to ·25 in. long; bracts lanceolate, acute, basifixed. *Calyx-lobes* ovate, acute, ·15 in. long, in fruit ·2 in. long. *Corolla* yellow; upper lip obovate, lower rounded, ·2 in. wide; spur straight or slightly incurved, ·2 in. long. *Capsule* sub-globose, enclosed within calyx-lobes, upraised on the sub-erect fruiting pedicels. *Seeds* ellipsoid, scrobiculate but not glochidiate or papillose. Oliv. in Journ. Linn. Soc. III. 182; Clarke in Hook. f. Flor. Brit. Ind. IV. 332; Ridl. Journ. Bot. XXXIII. 11. *U. scandens*, Benj. in Linnæa XX. 309 *chiefly*. *U. macrolepis*, Wight Ic. t. 1580, fig. 2. *fide* Clarke. *U. capillacea*, Thw. Enum. 171 (*not of* Oliv.).

Malacca: Mount Ophir, at 4,000 feet elevation, growing among grasses, *Ridley !*—Distrib. Throughout India.

8. Utricularia involvens, Ridl. Journ. Bot. XXXIII. 11. A tufted herb forming mats of leaves on rocks in streams; stems twining, fairly stout, 12 in. long. *Leaves* thinly membranous, spathulate-linear, obtuse, 1 in. long or longer, ·1 in. across. *Flowers* large, racemed at ends of stems; pedicels ·5 to ·75 in. long; bracts lanceolate, acute, basifixed, ·1 in. long. *Calyx-lobes* oblong-ovate, ·25 in. long. *Corolla* lemon-yellow; upper lip obovate, lower rounded, 2-lobed, ·35 in. wide; spur straight, pendulous, acute or acuminate, ·25 in. long. *Capsule* unknown.

Kedah: Kedah Peak (Gunong Jerai), at 3,000 feet elevation, in streams and wet places, *Ridley !*.

A very fine and remarkably distinct species.

9. Utricularia verticillata, Benj. Linnæa XX. 312. A slender erect weed of wet places. *Leaves* 0 at time of flowering and not seen; roots fibrous, bladders not seen. *Scapes* slender, sometimes capillary, rigid, branched, 3 to 10 in. long, glabrous; beset with a few ovate scales or empty bracts, acute at both ends and produced downwards beyond point of insertion; pedicels capillary, puberulous, ·2 in. long in flower, in fruit ·25 in. long; bracts and bracteoles produced below point of insertion. *Calyx* 2-lobed, lobes sub-equal, sub-orbicular, in fruit ·1 in. long. *Corolla* (? yellow) ·15 in. wide; spur wide-cylindric, slightly exceeding lower lip of corolla. *Capsule* globose, ·15 in. in diam., projecting beyond the closely adpressed calyx-lobes. *Seeds* minute, with sub-hexagonal reticulations. Oliv. Journ. Linn. Soc. III. 184; Hook. f. Flor. Brit. Ind. IV. 333; Ridl. Journ. Bot. XXXIII. 10. *U. bifida*, Wight Ic. t. 1584, f. 2 (*not of* Linn.).

KEDAH: Langkawi, *Curtis!* MALACCA: *Griffith!* PAHANG: Kwala Pahang, *Ridley* 1481 *in part!*

Oliver has suggested that the colour of the corolla in this species is yellow, and the fact that Ridley has mixed it (under his n. 1481) with *U. bifida* might be taken as corroborating Oliver's opinion. Ridley, in his paper on the Malay Peninsula *Utricularias*, says, however, that the flowers are pink.

10. **UTRICULARIA RACEMOSA**, Wall.; var. *filicaulis*, Clarke in Flor. Brit. Ind. IV. 333. A slender herb of damp places. *Leaves* linear or spathulate, absent at time of flowering; roots fibrous, bladders not seen. *Scapes* erect, very slender, 2 to 4 in. high, rarely higher, rather rigid, occasionally with a few branches, glabrous; beset with a few ovate scales or empty bracts acute at both ends and produced below point of attachment. *Flowers* few, scattered sessile; bracts and bracteoles ovate-lanceolate, attached above the base. *Calyx* 2-lobed, lobes sub-equal, the upper slightly the longer, obtuse, ·1 in. long in flower, in fruit ·12 in. long. *Corolla* white, from ·15 to ·2 in. across; spur straight, conical or sub-cylindric, longer than lower lip of corolla. *Capsule* globose, ·1 in. long, hidden by the adpressed calyx-lobes. *Seeds* minute, obscurely scrobiculate. *U. filicaulis*, Wall. Cat. 1501; A. DC. Prod. VIII. 21; Oliv. in Journ. Linn. Soc. III. 186. *U. nivea*, Vahl Enum. I. 203; Wall. in Roxb. Fl. Ind. ed. Carey & Wall. I. 144; Wight Ic. t. 1582. *U. setacea*, Wall. Cat. 6398 *partly*. *U. campestris*, Miq. in Pl. Hohenack. n. 596. *U. racemosa*, Ridl. Journ. Bot. XXXIII. 10 (*hardly of* Wall.).

MALACCA: Ayer Keroh, *Ridley* 10706! PAHANG: Kwala Pahang, *Ridley* 1474A! SINGAPORE: Changi, *Ridley*. PENANG: Waterfall, *Curtis*, fide *Ridley*.—DISTRIB. Indo-China, India.

This plant probably quite deserves to be considered a species distinct from *U. racemosa*, though except in its usually smaller size and its white instead of blue flowers, there is little to distinguish the two.

11. **UTRICULARIA OPHIRENSIS**, Ridl. Journ. Bot. XXXIII. 10. A herb. *Leaves* linear-spathulate or spathulate, absent at time of flowering; roots fibrous; bladders not seen. *Scapes* erect 8 to 16 in. high, slender, rigid, often branching, glabrous; beset with a few ovate scales or empty bracts acute at both ends and produced below point of attachment. *Flowers* sessile, clustered at the ends of the stems and branches in globose or oblong heads ·3 to ·5 in. long, ·25 in. across; bracts and bracteoles ovate-lanceolate, attached above the base. *Calyx* 2-lobed, lobes sub-equal, the upper slightly the larger, obtuse, ·1 in. long in flower, in fruit ·12 in. long. *Corolla* ·25 in. across, variable in colour, the lower lip rose-coloured (*Ridley*), both lips blueish with a yellow

hairy gland in the centre of the lower lip inside (*Scortechini*), or white (*Curtis, Kunstler*), or white with a yellow tinge (*Kunstler*); spur straight with an incurved tip (*Ridley*), or curved ascending (*Scortechini*), ·2 in. long. *Capsule* globose or depressed-globose, hidden by the adpressed calyx-lobes, ·1 in. long. *Seeds* oblong or obovate, brown, the broad end glochidiate.

PERAK: Larut, *King's Collector* 1931! 3820! Thaipeng, *Wray* 131! *Scortechini* 376! PENANG: Waterfall, *Curtis!* MALACCA: Padang Batu, *Ridley* 10091!

This species, which is here sustained on the authority of Mr. Ridley, who knows well the Malayan *Utricularias* in the field, does not differ very greatly from *U. racemosa*, Wall.; not so much indeed as does the variety *filicaulis* previously described. It matters little whether the three forms are considered specifically distinct or are treated as manifestations of one protean species. A drawing by Mr. Ridley shows pink flowers.

12. UTRICULARIA ORBICULATA, Wall. Cat. 1500. A slender herb growing on wet banks, rocks, or tree-trunks. *Leaves* all radical or on small offsets, persistent, orbicular or orbicular-spathulate, ·15 in. across; petioles distinct ·15 to ·25 in. long; roots fibrous, sometimes with bladders. *Scapes* erect, sub-capillary, 2 to 5 in. long; usually 2–4-flowered, sometimes 6–10-flowered; naked or with one or two empty scales, slightly produced at the base; flowers on capillary pedicels ·15 to ·25 in. long, rather distant; bracts and bracteoles minute, ovate-acute. *Calyx* 2-lobed, the lower lobe very much smaller than the upper, both obtuse, the upper often emarginate, ·12 in. long in fruit and about as broad as long. *Corolla* pale violet or white with a yellow centre, ·2 to ·25 in. wide, with an explanate 5-lobed lower lip and a linear sub-acute spur ·2 in. long about as long as the lower lip. *Capsule* globose, ·1 in. across, covered by the upper calyx-lobe but projecting beyond the lower. *Seeds* minute, obovoid, glochidiate throughout the upper thicker half. A. DC. Prod. VIII. 18; Oliv. Journ. Linn. Soc. III. 187; Dalz. & Gibs. Bomb. Flor. 136; Hook. f. Flor. Brit. Ind. IV. 334; Ridl. Journ. Bot. XXXIII. 11. *U. pusilla*, Grah. Cat. Bomb. Pl. 165. *U. glochidiata*, Wight Ic. t. 1581.

KEDAH: Telayah Tujon, *Curtis!* PERAK: Larut, *Scortechini* 376! on Gunong Bubu, growing on steep side of hill in the sun, amongst moss, at 5,000 feet, flower pale violet; *Wray* 3880! on Gunong Mas, at 5,000 feet, flower white with yellow centre; *Wray* 4146! MALACCA: Mount Ophir, *Griffith*; *Ridley!*—DISTRIB Throughout S.E. Asia.

Order LXXXVII. BIGNONIACEÆ.

Trees or climbing shrubs, more rarely herbs. *Leaves* opposite, rarely whorled or alternate, entire or 1- 2- 3-pinnate or digitate; leaflets entire or sometimes toothed. *Inflorescence* of terminal racemes or panicles; bracts various; flowers showy, usually large, hermaphrodite, irregular or regular. *Calyx* gamosepalous, campanulate, truncate or spathaceous or 2–5-lobed, valvate. *Corolla* gamopetalous, tubular-ventricose, mouth 2-lipped; lobes 5, sub-equal, patent or erecto-patent, bilabiately imbricate in bud. *Stamens* alternate with the corolla-lobes, inserted on the tube, 5 or more usually 4 from the fifth being absent or rudimentary; filaments filiform, often slightly thickened and sometimes hairy at the base; anthers 2-celled, included or shortly exsert; cells oblong or linear, parallel or divergent, dehiscing longitudinally. *Disk* hypogynous, cushion-like or annular, sometimes absent. *Ovary* sessile or shortly stalked, superior, 1–2-celled; style long, filiform; stigma of 2 flattened ovate or oblong lobes; ovules numerous, usually horizontal, anatropous, inserted in 2 to many rows in vertical lines along the edges of the septum in each cell. *Fruit* generally an elongate capsule, loculicidally or septicidally bivalved; the septum enlarged in fruit, deciduous together with the placentas. *Seeds* transverse, affixed by their margins to the septum or to enlarged placentas, vertically compressed, discoid or trigonous, often with a broad wing, embryo usually enveloped in a fine interior membrane; exalbuminous, cotyledons flattened, sometimes folded, radicle stout, lateral.—DISTRIB. Tropical regions of the world, a few in warm temperate regions; absent from Europe, the Mediterranean region and New Zealand. Species about 50.

Stamens 5; a tree with opposite 2–3-pinnate leaves and very large flat capsules .. .. 1. OROXYLUM.
Stamens 4; trees:—
  Anther-cells 2, both perfect:—
    Leaves 1–3-pinnate:—
      Calyx spathaceous, split on one side .. .. 2. DOLICHANDRONE.
      Calyx lobed or truncate:—
        Septum of the capsule cylindric, spongy:—
          Septum prominently pitted; seeds trigonous, transversely grooved without, inner lobe fitting into the septum-pit; ovules 2-seriate in each cell .. .. 3. STEREOSPERMUM.
          Septum only faintly pitted; seeds flat; ovules many-seriate in each cell .. .. .. 4. RADERMACHERA.
        Septum flat, capsule winged; a large tree with large flowers .. .. 5. PAJANELIA.

Leaves simple, often verticillate ; calyx usually more or less bilabiate .. .. 6. DIPLANTHERA.

Anther-cells 1 perfect, 1 reduced to a small hook ; a tall tree with 2–3-pinnate leaves and very long narrowly-linear corolla-tube .. .. 7. MILLINGTONIA.

1. OROXYLUM, Vent.

A glabrous tree. *Leaves* opposite, large, 2–3-pinnate ; leaflets entire. *Flowers* large, in a long, stout, terminal raceme. *Calyx* large, leathery, campanulate, truncate or obscurely toothed, persistent. *Corolla* large, fleshy ; tube campanulate-ventricose ; lobes 5, 2 in upper, 3 in lower lip, recurved, toothed, crumpled. *Stamens* 5 inserted near base of tube, posterior one the shortest. *Anthers* 2-celled ; cells parallel, oblong. *Disk* large, cushion-like. *Ovary* sub-sessile, contracted at the base, compressed ; style slender ; stigma 2-lobed ; ovules in 4 vertical rows on each placenta, very many. *Capsule* very large, broadly linear, compressed parallel to the septum, septifragally 2-valved. *Seeds* very many, flattened, surrounded by a broad hyaline wing.—DISTRIB. A single S.E. Asiatic species.

OROXYLUM INDICUM, Vent. Dec. Gen. Nov. 8 (1808). A small tree, reaching 30 to 40 feet in height, with a clean bole and few branches or often none, the head bearing leaves only ; branches thick ; bark somewhat fleshy ; pith large. *Leaves* extremely large, 1–3-pinnate, the lower 3-, middle ones 2-, upper 1-pinnate ; 3 to 5 feet long, triangular in outline ; rachis smooth, striate, stout, swollen at the base (pulvinus) and joints ; primary pinnæ about 45 pairs, the lower ones 2-pinnate at base, pinnules 3- to 5-foliolate ; leaflets ovate, entire, acuminate at apex, side ones rounded and often unequal at base, terminal one cuneate at base ; 3 to 6 in. long, 2 to 2·5 in. broad ; main-nerves 4 to 5 pairs ; petiolules slender, ·2 to ·3 in. long. *Raceme* branch-like, 2 to 3 feet long, very thick, lower part prominently marked with the ovate scars of fallen pedicels ; pedicels ·5 in. long, stout ; bracteoles fused with pedicels. *Calyx* campanulate, 1 in. long, fleshy, truncate, with 5 short teeth. *Corolla* fleshy, 2·5 in. long, yellowish ; lobes much crumpled, red, villous on both sides. *Stamens* 5, shortly exsert ; base of filaments woolly ; anthers divergent below ; connective shortly mucronate. *Disk* fleshy, cupular, somewhat lobed. *Ovary* oblong ; style slender, hollow, as long as the stamens ; stigma 2-lobed, lobes rounded. *Capsule* shortly stalked, concave-flat, elongate oblong, 1·5 to 2·5 feet long, 2·5 to 3·5 in. broad, scarcely ·3 in. thick, margins somewhat incurved, back keeled, valves woody, septum flat. *Seeds* very many, flat, surrounded by a very thin, hyaline, shining wing, somewhat rectangular in shape, 3 in. long, 1·5 in. broad ; testa membranous ; cotyledons emarginate, oblong. Kurz For.